

Samsung Semiconductor, Inc.

Product Selection Guide

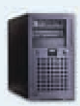
Memory and Storage

January 2009

Samsung Semiconductor, Inc.

Samsung offers the industry's broadest memory portfolio and has maintained its leadership in memory technology for 16 straight years. Its DRAM, flash and SRAM products are found in computers—from ultra-mobile portables to powerful servers—and in a wide range of handheld devices such as smartphones and MP3 players. Samsung also delivers the industry's widest line of storage products. These inlcude optical and hard disk drives as well as flash storage, such as the all-flash Solid State Drive and a range of embedded and removable flash storage products.

SAMSUNG PRODUCT OFFERINGS

Markets		DRAM	SRAM	FLASH	ASIC	LOGIC	TFT/LCD	ODD/HDD
Mobile/Wireless								
Notebook PCs								
Desktop PCs/Workstations								
Servers								
Networking/ Communications								
Consumer Electronics								

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DDR3 SDRAM REGISTERED MODULES

Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Banks
1GB	128Mx72	M393B2873DZ1-C(F7/F8/H9)	1Gb (128M x8)*9	RoHS	800/1066/1333	1
2GB	256Mx72	M393B5673DZ1-C(F7/F8/H9)	1Gb (128M x8)*18	RoHS	800/1066/1333	2
2GB	256Mx72	M393B5670DZ1-C(F7/F8/H9)	1Gb (256M x4)*18	RoHS	800/1066/1333	1
4GB	512Mx72	M393B5173DZ1-C(F7/F8)	1Gb (128M x8)*36	RoHS	800/1066	4
4GB	512Mx72	M393B5170DZ1-C(F7/F8/H9)	1Gb (256M x4)*36	RoHS	800/1066/1333	2
8GB	1Gx72	M393B1G70DJ1-C(F7/F8)	2Gb (512M x4)*36	RoHS	800/1066	4
1GB	128Mx72	M393B2873EH1-C(F7/F8/H9)	1Gb (128M x8)*9	RoHS & Halogen Free	800/1066/1333	1
2GB	256Mx72	M393B5673EH1-C(F7/F8/H9)	1Gb (128M x8)*18	RoHS & Halogen Free	800/1066/1333	2
2GB	256Mx72	M393B5670EH1-C(F7/F8/H9)	1Gb (256M x8)*18	RoHS & Halogen Free	800/1066/1333	1
4GB	512Mx72	M393B5173EH1-C(F7/F8)	1Gb (128M x8)*36	RoHS & Halogen Free	800/1066	4
4GB	512Mx72	M393B5170EH1-C(F7/F8/H9)	1Gb (256M x4)*36	RoHS & Halogen Free	800/1066/1333	2
8GB	1Gx72	M393B1G70EM1-C(F7/F8)	2Gb (512M x4)*36	RoHS & Halogen Free	800/1066	4
8GB	1Gx72	M393B1K70BH1-C(F7/F8/H9)	2Gb (512M x4)*36	RoHS & Halogen Free	800/1066/1333	2
16GB	2Gx72	M393B2K70BM1-C(F7/F8)	4Gb (1024M x4)*36	RoHS & Halogen Free	800/1066	4
1GB	128Mx64	M471B2874DZ1-C(F7/F8/H9)	1Gb (64M x16)*8	RoHS	800/1066/1333	2
2GB	256Mx64	M471B5673DZ1-C(F7/F8/H9)	1Gb (128M x8)*16	RoHS	800/1066/1333	2
1GB	128Mx64	M471B2873EH1-C(F8/H9)	1Gb (128M x8)*8	RoHS & Halogen Free	1066/1333	1
1GB	128Mx64	M471B2874EH1-C(F8/H9)	1Gb (64M x16)*8	RoHS & Halogen Free	1066/1333	2
2GB	256Mx64	M471B5673EH1-C(F8/H9)	1Gb (128M x8)*16	RoHS & Halogen Free	1066/1333	2
4GB	512Mx64	M471B5273BH1-C(F8/H9)	2Gb (256M x8)*16	RoHS & Halogen Free	1066/1333	2

NOTES:
F7= DDR3-800 (6-6-6)
F8 = DDR3-1066 (7-7-7)
H9 = DDR3-1333 (9-9-9)
Voltage = 1.5V

DDR3 SDRAM UNBUFFERED MODULES

Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Module Ranks
1GB	128Mx64	M378B2873DZ1-C(F8/H9)	1Gb (128M x8)*8	RoHS	1066/1333	1
2GB	256Mx64	M378B5673DZ1-C(F8/H9)	1Gb (128M x8)*16	RoHS	1066/1333	2
1GB	128Mx64	M378B2873EH1-C(F8/H9)	1Gb (128M x8)*8	RoHS & Halogen Free	1066/1333	1
2GB	256Mx64	M378B5673EH1-C(F8/H9)	1Gb (128M x8)*16	RoHS & Halogen Free	1066/1333	2
4GB	512Mx64	M378B5273BH1-C(F8/H9)	2Gb (256M x8)*16	RoHS & Halogen Free	1066/1333	2

DDR3 SDRAM UNBUFFERED MODULES (ECC)

Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Module Ranks
1GB	128Mx72	M391B2873DZ1-C(F8/H9)	1Gb (128M x8)*9	RoHS	1066/1333	1
2GB	256Mx72	M391B5673DZ1-C(F8/H9)	1Gb (128M x8)*18	RoHS	1066/1333	2
1GB	128Mx72	M391B2873EH1-C(F8/H9)	1Gb (128M x8)*9	RoHS & Halogen Free	1066/1333	1
2GB	256Mx72	M391B5673EH1-C(F8/H9)	1Gb (128M x8)*18	RoHS & Halogen Free	1066/1333	2
4GB	512Mx72	M391B5273BH1-C(F8/H9)	2Gb (256M x8)*18	RoHS & Halogen Free	1066/1333	2

DDR3 SDRAM COMPONENTS

Density	Organization	Part Number	# Pins - Package	Compliance	Speed (Mbps)	Package Dimensions
1Gb	256M x4	K4B1G0446D-HC(F7/F8/H9)	82 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x11mm
1Gb	128M x8	K4B1G0846D-HC(F7/F8/H9)	82 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x11mm
1Gb	64M x16	K4B1G1646D-HC(F7/F8/H9)	100 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x13.3mm
1Gb	256M x4	K4B1G0446E-HC(F7/F8/H9)	78 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	7.5x11mm
1Gb	128M x8	K4B1G0846E-HC(F7/F8/H9)	78 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	7.5x11mm
1Gb	64M x16	K4B1G1646E-HC(F7/F8/H9)	96 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	7.5x13.3mm
2Gb	512M x4	K4B2G0446B-HC(F7/F8/H9)	78 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x11.5mm
2Gb	256M x8	K4B2G0846B-HC(F7/F8/H9)	78 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x11.5mm
2Gb	128M x16	K4B2G1646B-HC(F7/F8/H9)	96 Ball -FBGA	RoHS & Halogen Free	800/1066/1333	9x13.3mm

NOTES:
F7= DDR3-800 (6-6-6)
F8 = DDR3-1066 (7-7-7)
H9 = DDR3-1333 (9-9-9)
Voltage = 1.5V

DDR2 SDRAM REGISTERED MODULES

				Module		Parity		
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Register	Rank	Production
512MB	64Mx72	M393T6553GZA-C(E6/F7)	(64M x8)*9	Lead free	667/800	Y	1	Now
		M393T6553GZ3-C(CC/D5)	(64M x8)*9	Lead free	400/533	N	1	Now
1GB	128Mx72	M393T2950GZA-C(E6/F7)	(128M x4)*18	Lead free	667/800	Y	1	Now
		M393T2950GZ3-C(CC/D5)	(128M x4)*18	Lead free	400/533	N	1	Now
		M393T2953GZA-C(E6/F7)	(64M x8)*18	Lead free	667/800	Y	2	Now
		M393T2953GZ3-C(CC/D5)	(64M x8)*18	Lead free	400/533	N	2	Now
		M393T2863QZA-C(E6/F7)	(128M x8)*9	Lead free	667/800	Y	1	Now
		M393T2863EHA-C(E6/F7/E7)	(128M x8)*9	Lead free & Halogen free	667/800	Y	1	Jan`09
2GB	256Mx72	M393T5750GZA-C(E6/F7)	(128M x4)*36	Lead free	667/800	Y	2	Now
		M393T5750GZ3-C(CC/D5)	(128M x4)*36	Lead free	400/533	N	2	Now
		M393T5660QZA-C(E6/F7/E7)	(256M x4)*18	Lead free	667/800	Y	1	Now
		M393T5660EHA-C(E6/F7/E7)	(256M x4)*18	Lead free & Halogen free	667/800	Y	1	Jan`09
		M393T5663QZA-C(E6/F7/E7)	(128M x8)*18	Lead free	667/800	Y	2	Now
		M393T5663EHA-C(E6/F7/E7)	(128M x8)*18	Lead free & Halogen free	667/800	Y	2	Jan`09
4GB	512Mx72	M393T5160QZA-C(E6/F7/E7)	(256M x4)*36	Lead free	667/800	Y	2	Now
		M393T5160EHA-C(E6/F7/E7)	(256M x4)*36	Lead free & Halogen free	667/800	Y	2	Jan`09
8GB	1Gx72	M393T1G60QJA-C(D5/E6)	DDP (512M x4)*36	Lead free	533/667	Y	4	Now
		M393T1G60EMA-C(D5/E6)	DDP (512M x4)*36	Lead free & Halogen free	533/667	Y	4	Jan`09
		M393T1K66AZA-C(E6/F7)	st. (1G x4)*18	Lead free	667/800	Y	2	Now

NOTES:
CC=PC2-3200 (DDR2-400 @ CL=3)
E6=PC2-5300 (DDR2-667 @ CL=5)
F7=PC2-6400 (DDR2-800 @ CL=6)
E7=PC2-6400 (DDR2-800 @ CL=5)
D5=PC2-4200 (DDR2-533 @ CL=4)
Voltage = 1.8V
Module Height = 1.2"

DDR2 SDRAM VLP REGISTERED MODULES

				Module		Parity		
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Register	Rank	Production
512MB	64Mx72	M392T6553GZA-C(E6/F7)	(64M x8)*9	Lead free	667/800	Y	1	Now
1GB	128Mx72	M392T2953GZA-C(E6/F7)	(64M x8)*18	Lead free	667/800	Y	2	Now
		M392T2950GZA-C(E6/F7)	(128M x4)*18	Lead free	667/800	Y	1	Now
		M392T2863QZA-C(E6/F7)	(128M x8)*9	Lead free	667/800	Y	1	Now
		M392T2863EHA-C(E6/F7)	(128M x8)*9	Lead free & Halogen free	667/800	Y	1	Feb '09
2GB	256Mx72	M392T5660QZA-C(E6/F7)	(256M x4)*18	Lead free	667/800	Y	1	Now
		M392T5660EHA-C(E6/F7)	(256M x4)*18	Lead free & Halogen free	667/800	Y	1	Feb '09
		M392T5663QZA-C(E6/F7)	(128M x8)*18	Lead free	667/800	Y	2	Now
		M392T5663EHA-C(E6/F7)	(128M x8)*18	Lead free & Halogen free	667/800	Y	2	Mar '09
4GB	512Mx72	M392T5160QJA-C(E6/F7)	DDP (512M x4)*18	Lead free	667/800	Y	2	Now
		M392T5160EMA-C(E6/F7)	DDP (512M x4)*18	Lead free & Halogen free	667/800	Y	2	Mar '09
8GB	1Gx72	M392T1G60EEH-C(D5/E6)	QDP (1G x4)*18	Lead free & Halogen free	533/667	Y	4	Q2`09

DDR2 SDRAM FULLY BUFFERED MODULES

				Module				
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Voltage	Rank	Production
512MB	64Mx72	M395T6553GZ4-CE6/F7/E7(50/60)	(64M x8)*9	Lead free	667/800	1.8V	1	Now
1GB	128Mx72	M395T2953GZ4-CE6/F7/E7(50/60)	(64M x8)*18	Lead free	667/800	1.8V	2	Now
		M395T2863QZ4-CE6/F7/E7(60/80/90)	(128M x8)*9	Lead free	667/800	1.8V	1	Now
		M395T2863EH4-CE6/F7/E7(60/80/90)	(128M x8)*9	Lead free & Halogen free	667/800	1.8V	1	Jan`09
		M395T2863QZ4-YE680	(128M x8)*9	Lead free	667	1.55V	1	Now
		M395T2863EH4-YE6/F7(80)	(128M x8)*9	Lead free & Halogen free	667/800	1.55V	1	Mar`09
2GB	256Mx72	M395T5750GZ4-CE6/F7/E7(50/60)	(128M x4)*36	Lead free	667/800	1.8V	2	Now
		M395T5663QZ4-CE6/F7/E7(60/80/90)	(128M x8)*18	Lead free	667/800	1.8V	2	Now
		M395T5663EH4-C(E6/F7/E7)(60/80/90)	(128M x8)*18	Lead free & Halogen free	667/800	1.8V	2	Jan`09
		M395T5663QZ4-YE680	(128M x8)*18	Lead free	667	1.55V	2	Now
		M395T5663EH4-YE6/F7(80)	(128M x8)*18	Lead free & Halogen free	667/800	1.55V	2	Feb '09
4GB	512Mx72	M395T5160QZ4-CE6/F7/E7(60/80/90)	(256M x4)*36	Lead free	667/800	1.8V	2	Now
		M395T5160EH4-C(E6/F7/E7)(60/80/90)	(256M x4)*36	Lead free & Halogen free	667/800	1.8V	2	Feb '09
		M395T5160QZ4-YE680	(256M x4)*36	Lead free	667	1.55V	2	Now
		M395T5160EH4-YE6/F7(80)	(256M x4)*36	Lead free & Halogen free	667/800	1.55V	2	Feb '09
		M395T5163QZ4-CE6/F7/E7(80)	(128M x8)*36	Lead free	667/800	1.8V	4	Now
		M395T5163EH4-CE6/F7/E7(80)	(128M x8)*36	Lead free & Halogen free	667/800	1.8V	4	Mar`09
		M395T5163QZ4-YE680	(128M x8)*36	Lead free	667	1.55V	4	Now
		M395T5163EH4-YE680	(128M x8)*36	Lead free & Halogen free	667	1.55V	4	Mar`09
		M395T5263AZ4-CE6/F7(60/80)	(256M x8)*18	Lead free	667/800	1.8V	2	Now
		M395T5263AZ4-YE680	(256M x8)*18	Lead free	667	1.55V	2	Now
8GB	1Gx72	M395T1G60QJ4-CE6/F7(80)	DDP (512M x4)*36	Lead free	667/800	1.8V	4	Now
		M395T1G60EM4-CE6/F7(80)	DDP (512M x4)*36	Lead free & Halogen free	667/800	1.8V	4	Mar`09
		M395T1G60QJ4-YE680	DDP (512M x4)*36	Lead free	667	1.55V	4	Now
		M395T1G60EM4-YE680	DDP (512M x4)*36	Lead free & Halogen free	667	1.55V	4	Mar`09
		M395T1K66AZ4-CE6/F7(60/80)	st. (1G x4)*18	Lead free	667/800	1.8V	2	Now
		M395T1K66AZ4-YE680	st. (1G x4)*18	Lead free	667	1.55V	2	Now

NOTES:
C: AMB Voltage = 1.5V
C: DRAM Voltage = 1.8V
Y*: AMB Voltage = 1.5V (Available only with CE6)
Y*: DRAM Voltage = 1.55V (Available only with CE6)

50: Intel C1 AMB
60: IDT D1 AMB
80 : IDT L4 AMB
90: Montage D1 AMB

800 Speed option would be limited along with AMB type.
Module Height = 1.2"

DDR2 SDRAM UNBUFFERED MODULES

Module							
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Rank	Production
512MB	64Mx64	M378T6553GZS-C(E6/F7/E7)	(64M x8)*8	Lead free	667/800	1	Now
		M378T6464QZ3-C(E6/F7/E7)	(64M x16)*4	Lead free	667/800	1	Now
1GB	128Mx64	M378T2953GZ3-C(E6/F7/E7)	(64M x8)*16	Lead free	667/800	2	Now
		M378T2863QZS-C(E6/F7/E7)	(128M x8)*8	Lead free	667/800	1	Now
		M378T2863EHS-C(E6/F7/E7)	(128M x8)*8	Lead free & Halogen free	667/800	1	Now
2GB	256Mx64	M378T5663QZ3-C(E6/F7/E7)	(128M x8)*16	Lead free	667/800	2	Now
		M378T5663EH3-C(E6/F7/E7)	(128M x8)*16	Lead free & Halogen free	667/800	2	Now
4GB	512Mx64	M378T5263AZ3-C(E6/F7)	(256M x8)*16	Lead free	667/800	2	Now

NOTES: E6=PC2-5300 (DDR2-667 @ CL=5)
E7=PC2-6400 (DDR2-800 @ CL=5)
F7=PC2-6400 (DDR2-800 @ CL=6)

Voltage = 1.8V
Module Height =1.2"

DDR2 SDRAM UNBUFFERED MODULES (ECC)

Module							
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Rank	Production
512MB	64Mx72	M391T6553GZ3-C(E6/F7/E7)	(64M x8)*9	Lead free	667/800	1	Now
1GB	128Mx72	M391T2863QZ3-C(E6/F7/E7)	(128M x8)*9	Lead free	667/800	1	Now
		M391T2863EH3-C(E6/F7/E7)	(128M x8)*9	Lead free & Halogen free	667/800	1	Jan '09
2GB	256Mx64	M391T5663QZ3-C(E6/F7/E7)	(128M x8)*18	Lead free	667/800	2	Now
		M391T5663EH3-C(E6/F7/E7)	(128M x8)*18	Lead free & Halogen free	667/800	2	Jan '09
4GB	512Mx64	M391T5263AZ3-C(E6/F7)	(256M x8)*18	Lead free	667/800	2	Now

NOTES: E6=PC2-5300 (DDR2-667 @ CL=5)
E7=PC2-6400 (DDR2-800 @ CL=5)
F7=PC2-6400 (DDR2-800 @ CL=6)

Voltage = 1.8V
Module Height =1.2"

DDR2 SDRAM SODIMM MODULES

Module							
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Rank	Production
512MB	64Mx64	M470T6554GZ3-C(E6/F7/E7)	(32M x16)*8	Lead free	667/800	2	Now
		M470T6464QZ3-C(E6/F7/E7)	(64M x16)*4	Lead free	667/800	1	Now
1GB	128Mx64	M470T2953GZ3-C(E6/F7/E7)	(64M x8)*16	Lead free	667/800	2	Now
		M470T2864QZ3-C(E6/F7/E7)	(64M x16)*8	Lead free	667/800	2	Now
		M470T2864EH3-C(E6/F7/E7)	(64M x16)*8	Lead free & Halogen free	667/800	2	Now
2GB	256Mx64	M470T5663QZ3-C(E6/F7/E7)	(128M x8)*8	Lead free	667/800	2	Now
		M470T5663EH3-C(E6/F7/E7)	(128M x8)*8	Lead free & Halogen free	667/800	2	Now
4GB	512Mx64	M470T5267AZ3-C(E6/F7)	st.(512M x8)*8	Lead free	667/800	2	Now

NOTES: E6=PC2-5300 (DDR2-667 @ CL=5)
E7=PC2-6400 (DDR2-800 @ CL=5)
F7=PC2-6400 (DDR2-800 @ CL=6)

Voltage = 1.8V
Module Height =1.2"

DDR2 SDRAM COMPONENTS

Density	Organization	Part Number	# Pins-Package	Dimensions	Package	Speed (Mbps)	Production
256Mb	16Mx16	K4T56163QI-ZC(E6/F7/E7)	84-FBGA	9x13mm	Lead free	667/800	Now
512Mb	128M x4	K4T51043QG-HC(E6/F7/E7)	60-FBGA	10x11mm	Lead free & Halogen free	667/800	Now
	64M x8	K4T51083QG-HC(E6/F7/E7)	60-FBGA	10x11mm	Lead free & Halogen free	667/800	Now
	32M x16	K4T51163QG-HC(E6/F7/E7/F8)	84-FBGA	11x13mm	Lead free & Halogen free	667/800/1066	Now
1Gb	256M x4	K4T1G044QQ-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Now
		K4T1G044QE-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Jan'09
	128M x8	K4T1G084QQ-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Now
		K4T1G084QE-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Now
	64M x16	K4T1G164QQ-HC(E6/F7/E7)	84-FBGA	11x18mm	Lead free & Halogen free	667/800	Now
		K4T1G164QE-HC(E6/F7/E7/F8)	84-FBGA	11x18mm	Lead free & Halogen free	667/800/1066	Jan'09
2Gb	512Mx4	K4T2G044QA-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Now
	256Mx8	K4T2G084QA-HC(E6/F7/E7)	68-FBGA	11x18mm	Lead free & Halogen free	667/800	Now

NOTES: E6=DDR2-667 (5-5-5) F7=DDR2-800 (6-6-6) E7=DDR2-800 (5-5-5) F8=DDR2-1066 (7-7-7) Voltage = 1.8V

DDR SDRAM 1U REGISTERED MODULES

				Module	
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)
512Mb	64Mx72	M312L6523FH3-CCC/B0	(64M x8)*9	Lead-free	333/400
1Gb	128Mx72	M312L2920FLS-CB0	(128M x4)*18	Lead-free	333/400
		M312L2923FH3-CCC/B0	(128M x8)*9	Lead-free	333/400
		M312L2920FH3-CB3	(128M x4)*18	Lead-free	333/400
2Gb	256Mx72	M312L5720FH3-CB3	(128M x4)*36	Lead-free	333/400

NOTES: B0 = DDR266 (133MHz @ CL=2.5) A2 = DDR266 (133MHz @ Cl=2) B3 = DDR333 (166MHz @ CL=2.5) CC = DDR400 (200MHz @ CL=3) Type: 184-pin

DDR SDRAM UNBUFFERED MODULES

				Module	
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)
512Mb	64MX64	M368L6523FLS-CCC/B3	(64M x8)*8	Lead-free & Halogen free	333/400
1Gb	128Mx64	M368L2923FLN-CCC/B3	(64M x8)*16	Lead-free & Halogen free	333/400

NOTES: B0 = DDR266 (133MHz @ CL=2.5) A2 = DDR266 (133MHz @ Cl=2) B3 = DDR333 (166MHz @ CL=2.5) CC = DDR400 (200MHz @ CL=3) Package: 66TSOP lead-free and halogen-free Voltage: 2.5V

DDR SDRAM SODIMM MODULES

				Module	
Density	Organization	Part Number	Composition	Compliance	Speed (Mbps)
512Mb	64MX64	M470L6524FL0-CB300	(32M x16)*8	Lead-free	333
1Gb	128Mx64	M470L2923F60-CB300	(64M x8)*16	Lead-free	333

NOTES: B0 = DDR266 (133MHz @ CL=2.5) CC = DDR400 (200MHz @ CL=3) B3 = DDR333 (166MHz @ CL=2.5) A2 = DDR266 (133MHz @ Cl=2)

DDR SDRAM COMPONENTS

Density	Organization	Part Number	# Pins - Package	Speed (Mbps)	Notes
256Mb	64Mx4	K4H560438J-LCB3/B0	66-TSOP	266/333	Halogen -free
	32Mx8	K4H560838J-LCCC/B3	66-TSOP	333/400	Halogen -free
	16Mx16	K4H561638J-LCCC/B3	66-TSOP	333/400	Halogen -free
512Mb	128Mx4	K4H510438F-LCB3/B0	66-TSOP	266/333	Halogen -free
		K4H510438F-HCCC/B3	60-FBGA	333/400	Halogen -free
	64Mx8	K4H510838F-LCCC/B3	66-TSOP	333/400	Halogen -free
		K4H510838F-HCCC/B3	60-FBGA	333/400	Halogen -free
	32Mx16	K4H511638F-LCCC/B3	66-TSOP	333/400	Halogen -free
128Mb	8Mx16	K4H281638L-LCCC/CD	66-TSOP	400/500	Halogen -free

NOTES:
B0 = DDR266 (133MHz @ CL=2.5)
A2 = DDR266 (133MHz @ Cl=2)
B3 = DDR333 (166MHz @ CL=2.5)
CC = DDR400 (200MHz @ CL=3)

SDRAM COMPONENTS

Density	Organization	Part Number	# Pins - Package	Speed (Mbps)	Refresh	Remarks
64Mb	8Mx8	K4S640832N-UC(75)000	54-TSOP	133	4K	K-die changing to N-die
	4Mx16	K4S641632N-UC(L)(75/60)000	54-TSOP	133/143/166	4K	K-die changing to N-die
128Mb	16Mx8	K4S280832K-UC(L)(75)000	54-TSOP	133	4K	I-die changing to K-die
	8Mx16	K4S281632K-UC(L)(75/60)000	54-TSOP	133/166	4K	I-die changing to K-die
256Mb	64Mx4	K4S560432J-UC(L)(75)000	54-TSOP	133	8K	H-die changing to J-die
	32Mx8	K4S560832J-UC(L)(75)000	54-TSOP	133	8K	H-die changing to J-die
	16Mx16	K4S561632J-UC(L)(75/60)000	54-TSOP	133/166	8K	H-die changing to J-die
512Mb	128Mx4	K4S510432D-UC(L)(75)000	54-TSOP	133	8K	
	64Mx8	K4S510832D-UC(L)(75)000	54-TSOP	133	8K	
	32Mx16	K4S511632D-UC(L)(75)000	54-TSOP	133	8K	

NOTES:
L = Commercial Temp., Low Power
For industrial temperature, check with SSI Marketing
Banks: 4
All products are lead free
Voltage: 3.3V
Speed: PC133 (133MHz CL=3/PC100 CL2)

RDRAM COMPONENTS

Density	Organization	Part Number	Speed (Mbps)	# Pins - Package	Refresh
288M	x18	K4R881869I-DC(M8/T9)	800/1066	92-FBGA	16K/32ms

NOTES:
Voltage: 2.5 V
All products are lead free

GRAPHICS DRAM COMPONENTS

Type	Density	Organization	Part Number	# Pins - Package	VDD/VDDQ	Speed Bin (MHz)	Effective Speed (Mbps)	Status
GDDR5	512Mb	16Mx32	K4G52324FG	170-FBGA	1.5/1.5V	800/900/1000	3200/3600/4000	
	1Gb	32Mx32	K4G10324FE	170-FBGA	1.5/1.5V	900/1000/1250	3600/4000/5000	CS in 1Q'09
GDDR3	1Gb	32Mx32	K4J10324QD	136-FBGA	1.8V/1.8V	700/800/900		
			K4J10324QD	136-FBGA	1.85V/1.85V	1000		
			K4J10324QE	136-FBGA	1.8V/1.8V	700/800/1000/1200/1300		CS in Q2'09
	512Mb	16Mx32	K4J52324QH	136-FBGA	1.8/1.8V	700/800		
			K4J52324QH	136-FBGA	1.9/1.9V	1000		
			K4J52324QH	136-FBGA	2.05/2.05V	1200		
			K4J52324QH	136-FBGA	2.05/2.05V	1300		
			K4J52324QI	136-FBGA	1.8/1.8V	700/800		CS in Q3'09
			K4J52324QI	136-FBGA	1.9/1.9V	1000		CS in Q3'09
			K4J52324QI	136-FBGA	2.05/2.05V	1200		CS in Q3'09
gDDR3	1Gb	64Mx16	K4W1G1646D	100 FBGA	1.5/1.5V	667		
			K4W1G1646D	100 FBGA	1.8V/1.8V	800/900		
			K4W1G1646E	100 FBGA	1.5V/1.5V	800/900/1000		CS in Q1'09
gDDR2	1Gb	64Mx16	K4N1G164QQ	84-FBGA	1.8/1.8V	400/500		
			K4N1G164QE	84-FBGA	1.8/1.8V	400/500		
	512Mb	32Mx16	K4N51163QG	84-FBGA	1.8/1.8V	400/500		
			K4N51163QZ	84-FBGA	1.8/1.8V	400/500		
GDDR1	128Mb	4Mx32	K4D263238K	144-FBGA	2.5/2.5V	200/250		
			K4D263238K	100-TQFP	2.5/2.5V	200/250		
		8Mx16	K4D261638K	66-TSOPII	2.5/2.5V	200/250		

NOTES:

(1) Package:
Lead Free or Halogen Free

(2) Architecture:
4 Banks or 8 Banks

(3) Speeds
(clock cycle - speed bin):
04: 0.4ns(5.0Gbps)
05: 0.5ns(4Gbps)
5C: 0.555(3.6Gbps)
06: 0.625(3.2Gbps)
07: 0.71ns (2.8Gbps)
08: 0.83ns (2.4Gbps)
09: 0.90ns (2.2Gbps)
1A: 1ns (2Gbps)
11: 1.1ns (1.8Gbps)
12: 1.25ns (1.6Gbps)
14: 1.429ns (1.4Gbps)
16: 1.667ns (1.2Gbps)
20: 2.0ns (1Gbps)
22: 2.2ns (0.9Gbps)
25: 2.5ns (0.8Gbps)
2A: 2.86ns (0.7Gbps)
33: 3.3ns (0.6Gbps
40: 4.0ns (0.5Gbps)
50: 5.0ns (0.4Gbps)

MOBILE SDRAM COMPONENTS

Type	Density	Organization	Part Number	# Pins-Package	Refresh	Power
MMSDRAM	512Mb	32M x16	K4M51163PE-(1)(2)(3)(4)	54-FBGA	8K	1.8V
			K4M51163PG-(1)(2)(3)(4)	54-FBGA	8K	1.8V
MMSDDDR	512Mb	32M x16	K4X51163PE-(1)(2)(3)(4)	60-FBGA	8K	1.8V
			K4X51163PG-(1)(2)(3)(4)	60-FBGA	8K	1.8V
MMSDRAM	512Mb	16M x32	K4M51323PE-(1)(2)(3)(4)	54-FBGA	8K	1.8V
			K4M51323PG-(1)(2)(3)(4)	90-FBGA	8K	1.8V
MMSDDDR	512Mb	16M x32	K4X51323PE-(1)(2)(3)(4)	54-FBGA	8K	1.8V
			K4X51323PG-(1)(2)(3)(4)	90-FBGA	8K	1.8V
MMSDRAM	256Mb	16M x16	K4M56163PI-(1)(2)(3)(4)	54-FBGA	8K	1.8V
MMSDDDR	256Mb	16M x16	K4X56163PI-(1)(2)(3)(4)	60-FBGA	8K	1.8V
MMSDRAM	256Mb	8M x32	K4M56323PI-(1)(2)(3)(4)	90-FBGA	8K	1.8V
MMSDDDR	256Mb	8M x32	K4X56323PI-(1)(2)(3)(4)	90-FBGA	8K	1.8V
MMSDRAM	128Mb	8M x16	K4M28163PN-(1)(2)(3)(4)	54-FBGA	4K	1.8V
	64Mb	4M x16	K4M641633K-(1)(2)(3)(4)	54-FBGA	4K	3.0V
			K4M64163LK-(1)(2)(3)(4)	54-FBGA	4K	2.5V
			K4M64163PK-(1)(2)(3)(4)	54-FBGA	4K	1.8V
MMSDDDR	1Gb	64M x16	K4X1G153PE-(1)(2)(3)(4)	60-FBGA	8K	1.8V
			K4X1G163PC-(1)(2)(3)(4)	60-FBGA	8K	1.8V
			K4X1G163PQ-(1)(2)(3)(4)	60-FBGA	8K	1.8V
		32M x32	K4X1G323PC-(1)(2)(3)(4)	90-FBGA	8K	1.8V
			K4X1G323PC-(1)(2)(3)(4)	152-FBGA	8K	1.8V
			K4X1G323PD-(1)(2)(3)(4)	90-FBGA	8K	1.8V
			K4X1G323PQ-(1)(2)(3)(4)	152-FBGA	8K	1.8V
	2Gb	64M x32	K4X2G303PD-(1)(2)(3)(4)		8K	1.8V

NOTES:

(1) Package:

Mobile SDRAM

1 : POP
2 : 90-FBGA(DDP)
3 : 90-FBGA(DDP,LF)
4 : 96-FBGA
5 : 96-FBGA(LF)
6 : MCP(LF,HF)
9 : 90-FBGA(LF,OSP)
A : FBGA(LF,TDP)
B : 54-CSP(LF,HF)
D : 90-FBGA_L(LF,HF)
E : FBGA(LF,MCP)
F : 90-FBGA_S
G : LGA(LF)
H : 90-FBGA_S(LF,HF)J : WBGA
K : 60-CSP(LF,HF,OSP)
L : 90-FBGA_SSD(LF,HF)
M : FBGA(MCP)
N : 54-CSP(LF,HF,OSP)
P : 54-CSP(LF,DDP)
Q : ISM
R : 54-FBGA
S : 90-FBGA_L
T : TSOP2-400
V : WBGA(LF)
Y : 54-CSP(DDP)

• It will be applied from each different generation by density.
(Halogen Free: 128Mb:14th, 256Mb:13th, 512Mb:8th,1Gb:5th generation)

Mobile DDR SDRAM

1 : MCP
2 : 90-FBGA(DDP)
3 : 90-FBGA(LF,DDP,HF)
4 : 96-FBGA
5 : 96-FBGA(LF,HF)
6 : FBGA(POP,LF,HF)
7 : 90-FBGA
8 : 90-FBGA(LF,HF)
9 : 110-FBGA(LF,HF)
A : 168-FBGA(LF,HF,DDP)
F : 60-FBGA(LF,HF)
G : 60-LGA(LF)
K : 104-FBGA(LF,HF)
L : WBGA(0.8MM)
M : 152-FBGA(POP,HF,LF)
N : 168-FBGA(LF,POP,HF)
P : 60-FBGA(LF,DDP,HF)
Q : ISM
R : 102-FBGA(HF,LF)
S : POP(DDP)

• It will be applied from each different generation by density.
(Halogen Free: 128Mb:14th, 256Mb:13th, 512Mb:8th,1Gb:5th generation)

Mobile DDR SDRAM PEA

1 : POP MONO
6 : POP MONO(LF,HF)
7 : 90-FBGA
8 : 90-FBGA(LF)
A : FBGA(LF,TDP)
F : 60-FBGA(LF)
H : ISM (10X10mm,1-side)
K : 72-FBGA(LF)
L : 60-FBGA
M : POP-SAC105(LF,DDP)
Q : ISM
S : POP(DDP)
X : POP(LF,DDP,HF)

• It will be applied from each different generation by density.
(Halogen Free: 128Mb:14th, 256Mb:13th, 512Mb:8th,1Gb:5th generation)

(2) Temp & Power:

C: Commercial (-25 ~ 70'C), Normal
L: Commercial, Low, i-TCSR
F: Commercial, Low, i-TCSR & PASR & DS
E: Extended (-25~85'C), Normal
N: Extended, Low, i-TCSR
G: Extended, Low, i-TCSR & PASR & DS
I: Industrial (-40~85'C), Normal
P: Industrial, Low
H: Industrial, Low, i-TCSR & PASR & DS

(3)-(4) Speed:

Mobile-SDRAM

60: 166MHz, CL 3
75: 133MHz, CL 3
80: 125MHz, CL 3
1H: 105MHz, CL 2
1L: 105MHz, CL 3
15: 66MHz, CL 2 & 3

Mobile-DDR

C3: 133MHz, CL 3
C2: 100MHz, CL 3
C0: 66MHz, CL 3

COMPONENT DRAM ORDERING INFORMATION

1	2	3	4	5	6	7	8	9	10	11
K	4	T	XX	XX	X	X	X	X	X	XX
SAMSUNG Memory	DRAM	DRAM Type	Density	Bit Organization	Number of Internal Banks	Interface (VDD, VDDQ)	Revision	Package Type	Temp & Power	Speed

1. Memory (K)

2. DRAM: 4

3. DRAM Type

B: DDR3 SDRAM
D: GDDR SDRAM
G: GDDR5 SDRAM
H: DDR SDRAM
J: GDDR3 SDRAM
M: Mobile SDRAM
N: gDDR2 SDRAM
S: SDRAM
T: DDR SDRAM
U: GDDR4 SDRAM
V: Mobile DDR SDRAM Power Efficient Address
W: gDDR3 SDRAM
X: Mobile DDR SDRAM
Y: XDR DRAM
Z: Value Added DRAM

4. Density

10: 1G, 8K/32ms
16: 16M, 4K/64ms
26: 128M, 4K/32ms
28: 128M, 4K/64ms
32: 32M, 2K/32ms
50: 512M, 32K/16ms
51: 512M, 8K/64ms
52: 512M, 8K/32ms
54: 256M, 16K/16ms
55: 256M, 4K/32ms
56: 256M, 8K/64ms
62: 64M, 2K/16ms
64: 64M, 4K/64ms
68: 768M, 8K/64ms
1G: 1G, 8K/64ms
2G: 2G, 8K/64ms
4G: 4G, 8K/64ms

5. Bit Organization

02: x2
04: x4
06: x4 Stack (Flexframe)
07: x8 Stack (Flexframe)
08: x8
15: x16 (2CS)
16: x16
26: x4 Stack (JEDEC Standard)
27: x8 Stack (JEDEC Standard)
30: x32 (2CS, 2CKE)
31: x32 (2CS)
32: x32

6. # of Internal Banks

2: 2 Banks
3: 4 Banks
4: 8 Banks
5: 16 Banks

7. Interface (VDD, VDDQ)

2: LVTTL, 3.3V, 3.3V
4: LVTTL, 2.5V, 2.5V
5: SSTL-2 1.8V, 1.8V
6: SSTL-15 1.5V, 1.5V
8: SSTL-2, 2.5V, 2.5V
A: SSTL, 2.5V, 1.8V
F: POD-15 (1.5V,1.5V)
H: SSTL_2 DLL, 3.3V, 2.5V
M: LVTTL, 1.8V, 1.5V
N: LVTTL, 1.5V, 1.5V
P: LVTTL, 1.8V, 1.8V
Q: SSTL-2 1.8V, 1.8V
R: SSTL-2, 2.8V, 2.8V
U: DRSL, 1.8V, 1.2V

8. Revision

A: 2nd Generation
B: 3rd Generation
C: 4th Generation
D: 5th Generation
E: 6th Generation
F: 7th Generation
G: 8th Generation
H: 9th Generation
I: 10th Generation
J: 11th Generation
K: 12th Generation
M: 1st Generation
N: 14th Generation
Q: 17th Generation

9. Package Type

DDR SDRAM

L: TSOP II (Lead-free & Halogen-free)
H: FBGA (Lead-free & Halogen-free)
F: FBGA for 64Mb DDR (Lead-free & Halogen-free)
6: sTSOP II (Lead-free & Halogen-free)
T: TSOP II
N: sTSOP II
G: FBGA
U: TSOP II (Lead-free)
V: sTSOP II (Lead-free)
Z: FBGA (Lead-free)

DDR2 SDRAM

Z: FBGA (Lead-free)
J: FBGA DDP (Lead-free)
Q: FBGA QDP (Lead-free)
H: FBGA (Lead-free & Halogen-free)
M: FBGA DDP (Lead-free & Halogen-free)
E: FBGA QDP (Lead-free & Halogen-free)
T: FBGA DSP (Lead-free & Halogen-free, Thin)

DDR3 SDRAM

Z: FBGA (Lead-free)
H: FBGA (Halogen-free & Lead-free)

Graphics Memory

Q: TQFP
U: TQFP (Lead Free)
G: 84/144 FBGA
V: 144 FBGA (Lead Free)
Z: 84 FBGA(Lead Free)
T: TSOP
L: TSOP (Lead Free)
A: 136 FBGA
B: 136 FBGA(Lead Free)
H: FBGA(Hologen Free & Lead Free)
E: 100 FBGA(Hologen Free & Lead Free)

SDRAM

L TSOP II (Lead-free & Halogen-free)
N: STSOP II
T: TSOP II
U: TSOP II (Lead-free)
V: sTSOP II (Lead-free)

COMPONENT DRAM ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11
	K	4	T	XX	XX	X	X	X	X	X	XX

1. SAMSUNG Memory
2. DRAM
3. DRAM Type
4. Density
5. Bit Organization
6. Number of Internal Banks
7. Interface (VDD, VDDQ)
8. Revision
9. Package Type
10. Temp & Power
11. Speed

XDR DRAM
J: BOC(LF) P: BOC

Mobile DRAM

Leaded / Lead Free
G/A: 52balls FBGA Mono
R/B: 54balls FBGA Mono
X /Z: 54balls BOC Mono
J /V: 60(72)balls FBGA Mono 0.5pitch
L /F: 60balls FBGA Mono 0.8pitch
S/D: 90balls FBGA

Monolithic (11mm x 13mm)
F/H: Smaller 90balls FBGA Mono
Y/P: 54balls CSP DDP
M/E: 90balls FBGA DDP

10. Temp & Power - COMMON (Temp, Power)

C: Commercial, Normal (0'C – 95'C) & Normal Power
C: (Mobile Only) Commercial (-25 ~ 70'C), Normal Power
J: Commercial, Medium
L: Commercial, Low (0'C – 95'C) & Low Power
L: (Mobile Only) Commercial, Low, i-TCSR
F: Commercial, Low, i-TCSR & PASR & DS
E: Extended (-25~85'C), Normal
N: Extended, Low, i-TCSR
G: Extended, Low, i-TCSR & PASR & DS
I: Industrial, Normal (-40'C – 85'C) & Normal Power
P: Industrial, Low (-40'C – 85'C) & Low Power
H: Industrial, Low, i-TCSR & PASR & DS

11. Speed (Wafer/Chip Biz/BGD: 00)

DDR SDRAM
CC: DDR400 (200MHz @ CL=3, tRCD=3, tRP=3)
B3: DDR333 (166MHz @ CL=2.5, tRCD=3, tRP=3) *1
A2: DDR266 (133MHz @ CL=2 , tRCD=3, tRP=3)
B0: DDR266 (133MHz @ CL=2.5, tRCD=3, tRP=3)
Note 1: "B3" has compatibility with "A2" and "B0"

DDR2 SDRAM
CC: DDR2-400 (200MHz @ CL=3, tRCD=3, tRP=3)
D5: DDR2-533 (266MHz @ CL=4, tRCD=4, tRP=4)
E6: DDR2-667 (333MHz @ CL=5, tRCD=5, tRP=5)
F7: DDR2-800 (400MHz @ CL=6, tRCD=6, tRP=6)
E7: DDR2-800 (400MHz @ CL=5, tRCD=5, tRP=5)

DDR3 SDRAM
F7: DDR3-800 (400MHz @ CL=6, tRCD=6, tRP=6)
F8: DDR3-1066 (533MHz @ CL=7, tRCD=7, tRP=7)
G8: DDR3-1066 (533MHz @ CL=8, tRCD=8, tRP=8)
H9: DDR3-1333 (667MHz @ CL=9, tRCD=9, tRP=9)
K0: DDR3-1600 (800MHz @ CL=11, tRCD=11, tRP=11)

Graphics Memory
18: 1.8ns (550MHz)
04: 0.4ns (2500MHz)
20: 2.0ns (500MHz)
05: 0.5ns (2000MHz)
22: 2.2ns (450MHz)
5C: 0.56ns (1800MHz)
25: 2.5ns (400MHz)
06: 0.62ns (1600MHz)
2C: 2.66ns (375MHz)
6A: 0.66ns (1500MHz)
2A: 2.86ns (350MHz)
07: 0.71ns (1400MHz)
33: 3.3ns (300MHz)
7A: 0.77ns (1300MHz)
36: 3.6ns (275MHz)
08: 0.8ns (1200MHz)
40: 4.0ns (250MHz)
09: 0.9ns (1100MHz)
45: 4.5ns (222MHz)
1 : 1.0ns (1000MHz)
50/5A: 5.0ns (200MHz)
1 : 1.1ns (900MHz)
55: 5.5ns (183MHz)
12: 1.25ns (800MHz)
60: 6.0ns (166MHz)
14: 1.4ns (700MHz)
16: 1.6ns (600MHz)

SDRAM (Default CL=3)
50: 5.0ns (200MHz CL=3)
60: 6.0ns (166MHz CL=3)
67: 6.7ns
75: 7.5ns PC133 (133MHz CL=3)

XDR DRAM
A2: 2.4Gbps, 36ns, 16Cycles
B3: 3.2Gbps, 35ns, 20Cycles
C3: 3.2Gbps, 35ns, 24Cycles
C4: 4.0Gbps, 28ns, 24Cycles
DS: Daisychain Sample

Mobile-SDRAM
60: 166MHz, CL 3
75: 133MHz, CL 3
80: 125MHz, CL 3
1H: 105MHz, CL 2
1L: 105MHz, CL 3
15: 66MHz, CL 2 & 3

Mobile-DDR
C3: 133MHz, CL 3
C2: 100MHz, CL 3
C0: 66MHz, CL 3

Note: All of Lead-free or Halogen-free product are in compliance with RoHS

MODULE DRAM ORDERING INFORMATION

1	2	3	4	5	6	7	8	9	10	11	12	13
M	X	XX	T	XX	X	X	X	X	X	X	XX	X
SAMSUNG Memory	DIMM	Data bits	DRAM Component Type	Depth	Number of Banks	Bit Organization	Component Revision	Package	PCB Revision	Temp & Power	Speed	AMB Vendor

1. Memory Module: M

2. DIMM Type

3: DIMM
4: SODIMM

3. Data bits

12: x72 184pin Low Profile Registered DIMM
63: x63 PC100 / PC133 µSODIMM with SPD for 144pin
64: x64 PC100 / PC133 SODIMM with SPD for 144pin (Intel/JEDEC)
66: x64 Unbuffered DIMM with SPD for 144pin/168pin (Intel/JEDEC)
68: x64 184pin Unbuffered DIMM
70: x64 200pin Unbuffered SODIMM
71: x64 204pin Unbuffered SODIMM
74: x72 /ECC Unbuffered DIMM with SPD for 168pin (Intel/JEDEC)
77: x72 /ECC PLL + Register DIMM with SPD for 168pin (Intel PC100)
78: x64 240pin Unbuffered DIMM
81: x72 184pin ECC unbuffered DIMM
83: x72 184pin Registered DIMM
90: x72 /ECC PLL + Register DIMM
91: x72 240pin ECC unbuffered DIMM
92: x72 240pin VLP Registered DIMM
93: x72 240pin Registered DIMM
95: x72 240pin Fully Buffered DIMM with SPD for 168pin (JEDEC PC133)

4. DRAM Component Type

B: DDR3 SDRAM (1.5V VDD)
L: DDR SDRAM (2.5V VDD)
S: SDRAM
T: DDR2 SDRAM (1.8V VDD)

5. Depth

09: 8M (for 128Mb/512Mb)
17: 16M (for 128Mb/512Mb)
16: 16M
28: 128M
29: 128M (for 128Mb/512Mb)
32: 32M
33: 32M (for 128Mb/512Mb)
51: 512M
52: 512M (for 512Mb/2Gb)
56: 256M
57: 256M (for 512Mb/2Gb)
59: 256M (for 128Mb/512Mb)
64: 64M
65: 64M (for 128Mb/512Mb)
1G: 1G
1K: 1G (for 2Gb)

6. # of Banks in Comp. & Interface

1: 4K/64mxRef., 4Banks & SSTL-2
2 : 8K/ 64ms Ref., 4Banks & SSTL-2
2: 4K/ 64ms Ref., 4Banks & LVTTL (SDR Only)
5: 8K/ 64ms Ref., 4Banks & LVTTL (SDR Only)
5: 4Banks & SSTL-1.8V
6: 8Banks & SSTL-1.8V

7. Bit Organization

0: x 4
3: x 8
4: x16
6: x 4 Stack (JEDEC Standard)
7: x 8 Stack (JEDEC Standard)
8: x 4 Stack
9: x 8 Stack

8. Component Revision

A: 2nd Gen.
B: 3rd Gen.
C: 4th Gen.
D: 5th Gen.
E: 6th Gen.
F: 7th Gen.
G: 8th Gen.
M: 1st Gen.
Q: 17th Gen.

9. Package

E: FBGA QDP (Lead-free & Halogen-free)
G: FBGA
H: FBGA (Lead-free & Halogen-free)
J: FBGA DDP (Lead-free)
M: FBGA DDP (Lead-free & Halogen-free)
N: sTSOP
Q: FBGA QDP (Lead-free)
T: TSOP II (400mil)
U: TSOP II (Lead-Free)
V: sTSOP II (Lead-Free)
Z: FBGA(Lead-free)

10. PCB Revision

0: Mother PCB
1: 1st Rev
2: 2nd Rev.
3: 3rd Rev.
4: 4th Rev.
A: Parity DIMM
S: Reduced PCB
U: Low Profile DIMM

11. Temp & Power

C: Commercial Temp. (0°C ~ 95°C) & Normal Power
L: Commercial Temp. (0°C ~ 95°C) & Low Power

12. Speed

CC: (200MHz @ CL=3, tRCD=3, tRP=3)
D5: (266MHz @ CL=4, tRCD=4, tRP=4)
E6: (333MHz @ CL=5, tRCD=5, tRP=5)
F7: (400MHz @ CL=6, tRCD=6, tRP=6)
E7: (400MHz @ CL=5, tRCD=5, tRP=5)
F8: (533MHz @ CL=7, tRCD=7, tRP=7)
G8: (533MHz @ CL=8, tRCD=8, tRP=8)
H9: (667MHz @ CL=9, tRCD=9, tRP=9)
K0: (800MHz @ CL=10, tRCD=10, tRP=10)
7A: (133MHz CL=3/PC100 CL2)

13. AMB Vendor for FBDIMM

0, 5: Intel
1, 6, 8: IDT
9: Montage

Note: All of Lead-free or Halogen-free product are in compliance with RoHS

MLC NAND FLASH

Family	Density	Technology	Part Number	Package Type	Org.	Vol(V)	MOQ Tray -xxxx0xx	MOQ T/R -xxx0Txx	Remarks
16Gb based 4KByte/Page Cache	128Gb DSP	51nm	K9MDG08U5M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9MDG08U5M-ZCB0	WELP	x8	3.3	960	1,000	
	64Gb QDP		K9HCG08U1M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9HCG08U1M-IIB0	ULGA	x8	3.3	960	1,000	
	32Gb DDP		K9LBG08U0M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9LBG08U1M-IIB0	ULGA	x8	3.3	720	2,000	2CE
	16Gb mono		K9GAG08U0M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9GAG08U0M-IIB0	ULGA	x8	3.3	720	2,000	
8Gb Based 2KByte/Page W/O Cache	32Gb QDP	59nm	K9HBG08U1B-PCB0	TSOP1	x8	3.3	960	1,000	
	16Gb DDP	51nm	K9LAG08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify B-die part # K9LAG08U0B-PCB0000
		59nm	K9LAG08U0B-PCB0	TSOP1	x8	3.3	960	1,000	
	8Gb mono	51nm	K9G8G08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify B-die, part # K9G8G08U0B-PCB0000
			K9G8G08U0A-IIB0	ULGA	x8	3.3	960	2,000	
		59nm	K9G8G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	
4Gb based	4Gb mono	63nm	K9G4G08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify B-die, part # K9G4G08U0B-PCB0000
		51nm	K9G4G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	

Please contact your local Samsung sales representative for latest product offerings.
Note: All parts are lead free

SLC NAND FLASH

Family	Density	Tech	Part Number	Package Type	Org.	Vol(V)	MOQ Tray -xxxx0xx	MOQ T/R -xxx0Txx	Remarks
8Gb Based 4KB/page	64Gb DSP	51nm	K9NCG08U5M-PCB0	TSOP1	x8	3.3	960	1,000	
	32Gb QDP		K9WBG08U1M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9WBG08U1M-PIB0	TSOP1	x8	3.3	960	1,000	
	16Gb DDP		K9KAG08U0M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9KAG08U0M-PIB0	TSOP1	x8	3.3	960	1,000	
	8G mono		K9F8G08U0M-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F8G08U0M-PIB0	TSOP1	x8	3.3	960	1,000	
4Gb Based 2KB/page	16Gb QDP	63nm	K9WAG08U1A-PCB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9WAG08U1B-PCB0000; A-die EOL:LTBO due Dec'08
			K9WAG08U1A-PIB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9WAG08U1B-PIB0000; A-die EOL: LTBO due Dec'08
			K9WAG08U1A-IIB0	ULGA	x8	3.3	960	2,000	A-die EOL: LTBO due Dec'08
		59nm	K9WAG08U1B-PCB0	TSOP1	x8	3.3	960	1,000	
			K9WAG08U1B-PIB0	TSOP1	x8	3.3	960	1,000	
			K9WAG08U1B-KIB0	ULGA HF & LF	x8	3.3	960	2,000	
	8Gb DDP	63nm	K9K8G08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9K8G08U0B-PCB0000; A-die EOL: LTBO due Dec'08
			K9K8G08U0A-PIB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9K8G08U0B-PIB0000; A-die EOL: LTBO due Dec'08
			K9K8G08U1A-IIB0	ULGA	x8	3.3	960	2,000	A-die EOL/LTBO due Dec'08
		59nm	K9K8G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	
			K9K8G08U0B-PIB0	TSOP1	x8	3.3	960	1,000	
			K9K8G08U1B-KIB0	ULGA HF & LF	x8	3.3	960	2,000	
	4Gb	63nm	K9F4G08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9F4G08U0B-PCB0000; A-die EOL: LTBO due Dec'08
			K9F4G08U0A-PIB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9F4G08U0B-PIB0000; A-die EOL: LTBO due Dec'08
			K9F4G08U0A-IIB0	ULGA	x8	3.3	960	2,000	A-die EOL: LTBO due Dec'08
		59nm	K9F4G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F4G08U0B-PIB0	TSOP1	x8	3.3	960	1,000	
			K9F4G08U0B-KIB0	ULGA HF & LF	x8	3.3	960	2,000	
2Gb	2Gb	63nm	K9F2G08U0A-PCB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9F2G08U0B-PCB0000; A-die EOL: LTBO due Dec'08
			K9F2G08U0A-PIB0	TSOP1	x8	3.3	960	1,000	qualify 59nm B-die: K9F2G08U0B-PIB0000; A-die EOL: LTBO due Dec'08
		59nm	K9F2G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F2G08U0B-PIB0	TSOP1	x8	3.3	960	1,000	
1Gb	1Gb	63nm	K9F1G08U0B-PCB0	TSOP1	x8	3.3	960	1,000	59nm C-die coming Oct'08: K9F1G08U0C-PCB0000; B-die EOL: LTBO due Mar'09
			K9F1G08U0B-PIB0	TSOP1	x8	3.3	960	1,000	59nm C-die coming Oct'08: K9F1G08U0C-PIB0000; B-die EOL: LTBO due Mar'09
			K9F1G08R0B-JIB0	63 FBGA(9.5x12)	x8	1.8	1,120	2,000	1.8v B-die supported through 2009
		59nm	K9F1G08U0C-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F1G08U0C-PIB0	TSOP1	x8	3.3	960	1,000	
512Mb	512Mb	63nm	K9F1208U0C-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F1208U0C-PIB0	TSOP1	x8	3.3	960	1,000	
			K9F1208R0C-JIB0	63 FBGA(8.5x13)	x8	1.8	1,120	2,000	
			K9F1208U0C-JIB0	63 FBGA(8.5x13)	x8	3.3	1,120	2,000	
256Mb	256Mb	90nm	K9F5608U0D-PCB0	TSOP1	x8	3.3	960	1,000	
			K9F5608U0D-PIB0	TSOP1	x8	3.3	1,000	1,000	
			K9F5608R0D-JIB0	63 FBGA(9x11)	x8	1.8	1,280	2,000	
			K9F5608U0D-JIB0	63 FBGA(9x11)		3.3	1,280	2,000	

Please contact your local Samsung sales representative for latest product offerings.

Note: All parts are lead free

Solid State Drives (SSD)*

Application	Interface		Size	Connector	Den.	Comp.	Part Number
PC/Notebook	SATA II SLC 3.0Gb/sec	PS410	1.8"	Thin uSATA	32GB	8Gb	MCBQE32G8MPP-0VA00
					64GB		MCCOE64G8MPP-0VA00
			2.5"	Thin SATA	32GB	8Gb	MCBQE32G5MPP-0VA00
					64GB		MCCOE64G5MPP-0VA00
			SLIM (caseless)	uSATA	32GB	8Gb	MCBQE32GFMPP-MVA00
					64GB		MCBQE64GFMPP-MVA00
	SATA II MLC 3.0Gb/sec	PM410	1.8"	Thin uSATA	64GB	16Gb	MMCRE64G8MPP-0VA00
					128GB		MMCQE28G8MUP-0VA00
			2.5"	Thin SATA	64GB	16Gb	MMCRE64G5MPP-0VA00
					128GB		MMDOE28G5MPP-0VA00
			SLIM (caseless)	uSATA	64GB	16Gb	MMCRE64GFMPP-MVA00
					128GB		MMCQE28GFMPP-MVA00
		PM800	2.5"	Thin SATA	64GB	16Gb	MMCRE64G5MXP-0VB00
					128GB		MMCRE28G5MXP-0VB00
					256GB		MMDOE56G5MXP-0VB00
			SLIM (caseless)	uSATA	64GB	16Gb	MMCRE64GFMXP-MVB00
					128GB		MMCRE28GFMXP-MVB00
Server/Storage	SATA II 3.0Gb/sec SLC	SS410	2.5"	Thin SATA	25GB	8Gb	MCBQE25G5MPQ-0VA03
					50GB		MCCOE50G5MPQ-0VA03
		SS415	2.5"	Thin SATA	50GB	8Gb	MCBQE32G5MPQ-0VA03
					64GB		MCCOE64G5MPQ-0VA03
		SS800	2.5"	Thin SATA	50GB	8Gb	MCBQE50G5MXP-0VB03
					100GB		MCCOE00G5MXP-0VB03
UMPC/Low-Cost PC	SATA II MLC	UM410	HALF SLIM	Thin SATA	8GB	16Gb	MMAGE08GSMPP-MVA00
					16GB		MMBRE16GSMPP-MVA00
					32GB		MMCRE32GSMPP-MVA00

*Please contact Marketing for the latest offerings.

FLASH

SD and MicroSD FLASH CARDS

Flash Cards							
Type	Density	Component		Controller	Manuf. Site	Part Number	MOQ
		Family	Ver.				
SD	1GB	8Gb MLC	B-die	SKYMEDI	STS	MM8GF01GWBCA-2MA00	135
	2GB	16G MLC	M-die	SKYMEDI	STS	MMAGF02GWMCA-2NA00	
	4GB			SKYMEDI	STS	MMAGF04GWMCA-2NA00	
	8GB			SKYMEDI	STS	MMAGF08GWMCA-2NA00	
MicroSD (without adapter)	512MB	4Gb MLC	A-die	SMI	STS	MM4GR512UACA-2PA00	600
				SMI	ATP	MM4GR512UACU-2PA00	
				SMI	SPIL	MM4GR512UACY-2PA00	
	1GB	8Gb MLC	B-die	SKYMEDI	SPIL	MM8GR01GUBCY-2MA00	
				SKYMEDI	STS	MM8GR01GUBCA-2MA00	
	2GB	8Gb MLC	B-die	SKYMEDI	SPIL	MM8GR02GUBCY-2MA00	
				SKYMEDI	STS	MM8GR02GUBCA-2MA00	
		16G MLC	M-die	SKYMEDI	STS	MMAGR02GUDCA-2MA00	
	4GB	8Gb MLC	B-die	SKYMEDI	SPIL	MM8GR04GUBCY-2MA00	
		16G MLC	M-die	SKYMEDI	STS	MMAGR04GUDCA-2MA00	
	8GB	16G MLC	M-die	SKYMEDI	STS	MMAGR08GUDCA-2MA00	

Please contact your local Samsung sales representative for latest product offerings.
Note: All parts are lead free.

FLASH PRODUCT ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	K	9	X	X	X	X	X	X	X	X	-	X	X	X	X

- 1: SAMSUNG Memory
- 2: NAND Flash
- 3: Small Classification
- 4: Density
- 5: Density
- 6: Organization
- 7: Organization
- 8: Vcc
- 9: Mode
- 10: Generation
- 11: ---
- 12: Package
- 13: Temp
- 14: Customer Bad Block
- 15: Pre-Program Version

1. Memory (K)

2. NAND Flash : 9

3. Small Classification

(SLC : Single Level Cell, MLC : Multi Level Cell)

7 : SLC moviNAND
8 : MLC moviNAND
F : SLC Normal
G : MLC Normal
H : MLC QDP
K : SLC DDP
L : MLC DDP
M : MLC DSP
N : SLC DSP
P : MLC 8 Die Stack
Q : SLC 8 Die Stack
S : SLC Single SM
T : SLC SINGLE (S/B)
U : 2 Stack MSP
W : SLC 4 Die Stack

4~5. Density

12 : 512M
56 : 256M
1G : 1G
2G : 2G
4G : 4G
8G : 8G
AG : 16G BG :
32G CG : 64G
DG : 128G
EG : 256G
LG : 24G
NG : 96G
ZG : 48G
00 : NONE

6~7. Organization

00 : NONE
08 : x8
16 : x16

8. Vcc

A : 1.65V~3.6V	B : 2.7V (2.5V~2.9V)
C : 5.0V (4.5V~5.5V)	D : 2.65V (2.4V~2.9V)
E : 2.3V~3.6V	R : 1.8V (1.65V~1.95V)
Q : 1.8V (1.7V~1.95V)	T : 2.4V~3.0V
U : 2.7V~3.6V	V : 3.3V (3.0V~3.6V)
W : 2.7V~5.5V, 3.0V~5.5V	0 : NONE

9. Mode

0 : Normal
1 : Dual nCE & Dual R/nB
3 : Tri /CE & Tri R/B
4 : Quad nCE & Single R/nB
5 : Quad nCE & Quad R/nB
9 : 1st block OTP
A : Mask Option 1
L : Low grade

10. Generation

M : 1st Generation
A : 2nd Generation
B : 3rd Generation
C : 4th Generation
D : 5th Generation

11. " ----"

12. Package

A : COB
B : FBGA (Halogen-Free, Lead-Free)
C : CHIP BIZ D : 63-TBGA
F : WSOP (Lead-Free) G : FBGA
H : TBGA (Lead-Free)
I : ULGA (Lead-Free) (12*17)
J : FBGA (Lead-Free)
L : ULGA (Lead-Free) (14*18)
M : TLGA N : TLGA2
P : TSOP1 (Lead-Free)
Q : TSOP2 (Lead-Free)
S : TSOP1 (Halogen-Free, Lead-Free)
T : TSOP2 U : COB (MMC)
V : WSOP W : Wafer
Y : TSOP1 Z : WELP (Lead-Free)

13. Temp

C : Commercial I : Industrial
0 : NONE (Containing Wafer, CHIP, BIZ, Exception handling code)

14. Customer Bad Block

B : Include Bad Block
D : Daisychain Sample
L : 1~5 Bad Block
N : ini. 0 blk, add. 10 blk
S : All Good Block
0 : NONE (Containing Wafer, CHIP, BIZ, Exception handling code)

15. Pre-Program Version

0 : None
Serial (1~9, A~Z)

LOW POWER ASYNCHRONOUS SRAM

Type	Density	Organization	Part Number	# Pins-Package	Vcc (V)	Speed (ns)	Temp	Current (mA)	Current (uA)	Production Status
UtRAM	64Mb	4Mx16	K1S6416BCE	48-FBGA	1.8	70	I	40	180	2Q'09
		4Mx16	K1S64161CE	48-FBGA	3.0	70	I	40	180	2Q'09
		4Mx16	K1B6416B2E	54-FBGA	1.8	104Mhz	I	40	180	2Q'09
UtRAM2	64Mb	4Mx16	K1C6416B2E	54-FBGA	1.8	104Mhz	I	40	180	2Q'09
		4Mx16	K1C6416B8E	54-FBGA	1.8	104Mhz	I	40	180	2Q'09
UtRAM	32Mb	2Mx16	K1S3216BCF	48-FBGA	1.8	70	I	35	120	3Q'09
		2Mx16	K1S32161CF	48-FBGA	3.0	70	I	35	100	3Q'09
		2Mx16	K1B3216B2F	54-FBGA	1.8	104Mhz	I	35	100	3Q'09
UtRAM2	32Mb	2Mx16	K1C3216B2F	54-FBGA	1.8	104Mhz	I	35	100	3Q'09
		2Mx16	K1C3216B8F	54-FBGA	1.8	104Mhz	I	35	100	3Q'09
UtRAM	16Mb	1Mx16	K1S1616B1C	48-FBGA	1.8	70	I	35	80	3Q'09
		1Mx16	K1S161611C	48-FBGA	3.0	70	I	35	95	3Q'09
UtRAM2	16Mb	1Mx16	K1C1616B2C	54-FBGA	1.8	104Mhz	I	35	100	3Q'09
		1Mx16	K1C1616B8C	54-FBGA	1.8	104Mhz	I	35	100	3Q'09

HIGH-SPEED ASYNCHRONOUS SRAM

Density	Organization	Part Number	# Pins-Package	Vcc (V)	Speed (ns)	Operaring Temp	Operating Current (mA)	Operating Current (mA)	Production Status
4Mb	256Kx16	K6R4016C1D	44-SOJ, 44-TSOP2	5	10	I	65, 55	20, 5	Mass Production
		K6R4016V1D	44-SOJ, 44-TSOP2	3.3	10	I	80, 65	20, 5 (1.2)	Mass Production
	1Mx4	K6R4004C1D	32-SOJ	5	10, 12	I	65, 55	20, 5	EOL
		K6R4004V1D	32-SOJ	3.3	8, 10	I	80, 65	20, 5	EOL
	512Kx8	K6R4008C1D	36-SOJ, 44-TSOP2	5	10	I	65, 55	20, 5	Mass Production
		K6R4008V1D	36-SOJ, 44-TSOP2	3.3	10	I	80, 65	20, 5	Mass Production

SYNCHRONOUS PIPELINED BURST AND FLOW-THRU

Density	Organization	Part Number	# Pins-Package	Operating Mode	Vdd (V)	Access Time tCD (ns)	Speed tCYC (MHz)	I/O Voltage (V)	Production Status	Comments
36Mb	2Mx18	K7A321830C	100-TQFP	SPB	3.3, 2.5	3.1	200	3.3, 2.5	Mass Production	2E1D
		K7B321835C	100-TQFP	SB	3.3, 2.5	7.5	118	3.3, 2.5	Mass Production	Ind Temp only
	1Mx36	K7A323630C	100-TQFP	SPB	3.3, 2.5	3.1	200	3.3, 2.5	Mass Production	2E1D
		K7B323635C	100-TQFP	SB	3.3, 2.5	7.5	118	3.3, 2.5	Mass Production	Ind Temp only
18Mb	512Kx36	K7A163630B	100-TQFP	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production	2E1D
		K7A163631B	100-TQFP	SPB	3.3, 2.5	3.1	200	3.3, 2.5	Mass Production	2E2D
		K7B163635B	100-TQFP	SB	3.3, 2.5	7.5	117	3.3, 2.5	Mass Production	
	1Mx18	K7A161830B	100-TQFP	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production	2E1D
		K7A161831B	100-TQFP	SPB	3.3, 2.5	3.1	200	3.3, 2.5	Mass Production	2E2D
		K7B161835B	100-TQFP	SB	3.3, 2.5	7.5	117	3.3, 2.5	Mass Production	
8Mb	256x36	K7A803609B	100-TQFP	SPB	3.3	2.6	250	3.3,2.5	Not for new designs	2E1D
		K7A803600B	100-TQFP	SPB	3.3	3.5	167	3.3,2.5	Not for new designs	2E1D
		K7B803625B	100-TQFP	SB	3.3	6.5	133	3.3,2.5	Not for new designs	
	512x18	K7A801809B	100-TQFP	SPB	3.3	2.6	250	3.3,2.5	Not for new designs	2E1D
		K7A801800B	100-TQFP	SPB	3.3	3.5	167	3.3,2.5	Not for new designs	2E1D
		K7B801825B	100-TQFP	SB	3.3	6.5	133	3.3,2.5	Not for new designs	
4Mb	128Kx32	K7A403609B	100-TQFP	SPB	3.3	2.4	250	3.3, 2.5	Not for new designs	2E1D
		K7A403600B	100-TQFP	SPB	3.3	3.5	167	3.3, 2.5	Not for new designs	2E1D
		K7B403625B	100-TQFP	SB	3.3	6.5	133	3.3, 2.5	Not for new designs	
		K7A403200B	100-TQFP	SPB	3.3	3.5	167	3.3, 2.5	Not for new designs	2E1D
	256Kx18	K7A401809B	100-TQFP	SPB	3.3	2.4	250	3.3, 2.5	Not for new designs	2E1D
		K7A401800B	100-TQFP	SPB	3.3	3.5	167	3.3, 2.5	Not for new designs	2E1D
		K7B401825B	100-TQFP	SB	3.3	6.5	133	3.3, 2.5	Not for new designs	

NOTES: All TQFP products are Lead Free
2E1D = 2-cycle Enable and 1-cycle Disable
2E2D = 2-cycle Enable and 2-cycle Disable
SPB speed recommendations: For 200MHz use 250MHz; For 133MHz use 167MHz
SB speed recommendation: Use 7.5ns Access Time use 6.5ns Access Time

NtRAM

Density	Organization	Part Number	# Pins-Package	Operating Mode	Vdd (V)	Access Time tCD (ns)	Speed tCYC (MHz)	I/O Voltage (V)	Production Status
72Mb	2Mx36	K7N643645M	100-TQFP, 165FBGA	SPB	2.5	2.6, 3.5	250, 167	2.5	Mass Production
	4Mx18	K7N641845M	100-TQFP, 165FBGA	SPB	2.5	2.6, 3.5	250, 167	2.5	Mass Production
36Mb	1Mx36	K7N323635C	100-TQFP, 165FBGA	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production
	2Mx18	K7N321835C	100-TQFP, 165FBGA	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production
	1Mx36	K7M323631C	100-TQFP	FT	3.3, 2.5	7.5	118	3.3, 2.5	Mass Production
	2Mx18	K7M321831C	100-TQFP	FT	3.3, 2.5	7.5	118	3.3, 2.5	Mass Production
18Mb	1Mx18	K7N161831B	100-TQFP, 165FBGA	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production
	512Kx36	K7N163631B	100-TQFP, 165FBGA	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	Mass Production
	1Mx18	K7M161835B	100-TQFP	FT (SB)	3.3	6.5	133	3.3, 2.5	Mass Production
	512Kx36	K7M163635B	100-TQFP	FT (SB)	3.3	6.5	133	3.3, 2.5	Mass Production
8Mb	256Kx36	K7N803601B	100-TQFP	SPB	3.3	3.5	167	3.3,2.5	Not for new designs
	512Kx18	K7N801801B	100-TQFP	SPB	3.3	3.5	167	3.3,2.5	Not for new designs
	256Kx36	K7N803609B	100-TQFP	SPB	3.3	2.6	250	3.3,2.5	Not for new designs
	512Kx18	K7N801809B	100-TQFP	SPB	3.3	2.6	250	3.3,2.5	Not for new designs
	256Kx36	K7N803645B	100-TQFP	SPB	2.5	3.5	167	2.5	Not for new designs
	512Kx18	K7N801845B	100-TQFP	SPB	2.5	3.5	167	2.5	Not for new designs
	256Kx36	K7N803649B	100-TQFP	SPB	2.5	2.6	250	2.5	Not for new designs
	512Kx18	K7N801849B	100-TQFP	SPB	2.5	2.6	250	2.5	Not for new designs
	512Kx18	K7M801825B	100-TQFP	FT	3.3	6.5	133	3.3, 2.5	Not for new designs
	256Kx36	K7M803625B	100-TQFP	FT	3.3	6.5	133	3.3, 2.5	Not for new designs
4Mb	128Kx36	K7N403609B	100-TQFP	SPB	3.3	3.0	200	3.3,2.5	Not for new designs
	256Kx18	K7N401809B	100-TQFP	SPB	3.3	3.0	200	3.3,2.5	Not for new designs

NOTES: All TQFP products are Lead Free
NtRAM speed recommendations: For 200MHz use 250MHz; For 133MHz use 167MHz
NtRAM speed recommendation: Use 7.5ns Access Time use 6.5ns Access Time
Recommended SPB speeds are 250MHz and 167MHz
Recommended SB Acess Speed is 7.5ns

LATE-WRITE RR AND R-L

Type	Density	Organization	Part Number	# Pins-Package	Operating Mode	Vdd (V)	Access Time tCD (ns)	Speed tCYC (MHz)	I/O Voltage (V)	Production Status
Late-Write R-R	32Mb	1Mx36	K7P323674C	119-BGA	SP	1.8 / 2.5V	1.6, 2.0	300,250	1.5 (Max 1.8)	C/S
		2Mx18	K7P321874C	119-BGA	SP	1.8 / 2.5V	1.6, 2.0	300,250	1.5 (Max 1.8)	C/S
	8Mb	256Kx36	K7P803611B	119-BGA	SP	3.3	1.6	300	1.5 (Max.2.0)	Not for new designs
		512Kx18	K7P801811B	119-BGA	SP	3.3	1.6	300	1.5 (Max.2.0)	Not for new designs
		256Kx36	K7P803666B	119-BGA	SP	2.5	2.0	250	1.5 (Max.2.0)	Not for new designs
		512Kx18	K7P801866B	119-BGA	SP	2.5	2.0	250	1.5 (Max.2.0)	Not for new designs
Late-Write R-R and R-L	4Mb	128Kx36	K7P403622B	119-BGA	SP	3.3	2.5,2.7,3.0	250,200,167	2.5/3.3	Not for new designs
		256Kx18	K7P401822B	119-BGA	SP	3.3	2.5,2.7,3.0	250,200,167	2.5/3.3	Not for new designs
		256Kx18	K7P401823B	119-BGA	SP	3.3	6.5	167	2.5/3.3	Not for new designs

DDR SYNCHRONOUS SRAM

Type	Density	Organization	Part Number	# Pins-Package	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Status	Comments
DDR	16Mb	512K x36	K7D163674B	153-BGA	1.8~2.5	2.3	330, 300	1.5~1.9	Mass Production	
		1M x18	K7D161874B	153-BGA	1.8~2.5	2.3	330, 300	1.5~1.9	Mass Production	
	8Mb	256K x36	K7D803671B	153-BGA	2.5	1.7/1.9/2.1	333, 330, 250	1.5(Max 2.0)	Not for new designs	
		512K x18	K7D801871B	153-BGA	2.5	1.7/1.9/2.1	333, 330, 250	1.5(Max 2.0)	Not for new designs	
DDR II CIO/ SIO	72Mb	4M x18	K7I641882M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-2B
			K7I641884M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-4B
			K7J641882M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	SIO-2B
		2M x36	K7I643682M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-2B
			K7I643684M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-4B
			K7J643682M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	SIO-2B
	36Mb	2M x18	K7I321882C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	CIO-2B
			K7I321884C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	CIO-4B
			K7J321882C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	SIO-2B
		1M x36	K7I323682C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	CIO-2B
			K7I323684C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	CIO-4B
			K7J323682C	165-FBGA	1.8	0.45	333,300,250	1.5,1.8	Mass Production	SIO-2B
	18Mb	1M x18	K7I161882B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-2B
			K7I161884B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-4B
			K7J161882B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	SIO-2B
		512K x36	K7J163682B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	SIO-2B
			K7I163682B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-2B
			K7I163684B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	CIO-4B
DDR II+ CIO	36Mb	2M x18	K7K3218T2C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	DDRII + CIO-2B
		1M x36	K7K3236T2C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	DDRII + CIO-2B
	18Mb	1M x18	K7K1618T2C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	DDRII + CIO-2B
		512K x36	K7K1636T2C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	DDRII + CIO-2B

NOTES:
2B = Burst of 2
4B = Burst of 4
SIO = Separate I/O
CIO = Common I/O

For DDR II CIO/SIO: C-die use 330, 300, or 250MHz instad of 200MHz or 167MHz using a stable DLL circuit
For DDR II+ CIO: 2-clock latency is available. A 2.5-clock latency can be supported on 18Mb at 500Mhz and 36Mb at 450MHz

QDR SYNCHRONOUS SRAM

Type	Density	Organization	Part Number	# Pins-Package	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Status	Comments
QDR II	72Mb	8M x9	K7R640982M	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II-2B
		4M x18	K7R641882M	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II-2B
			K7R641884M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	QDR II-4B
		2M x36	K7R643682M	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II-2B
			K7R643684M	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	QDR II-4B
	36Mb	4M x9	K7R320982C	165-FBGA	1.8	0.45	300, 250, 200	1.5,1.8	Mass Production	QDR II-2B
		2M x18	K7R321882C	165-FBGA	1.8	0.45	300, 250, 200	1.5,1.8	Mass Production	QDR II-2B
			K7R321884C	165-FBGA	1.8	0.45	333, 300, 250	1.5,1.8	Mass Production	QDR II-4B
		1M x36	K7R323682C	165-FBGA	1.8	0.45	300, 250, 200	1.5,1.8	Mass Production	QDR II-2B
			K7R323684C	165-FBGA	1.8	0.45	333, 300, 250	1.5,1.8	Mass Production	QDR II-4B
QDR I, QDR II	18Mb	2M x9	K7R160982B	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II - 2B
		1M x18	K7R161882B	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II - 2B
			K7R161884B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	QDR II - 4B
			K7Q161862B	165-FBGA	1.8v / 2.5v	2.5	167	1.5,1.8	Mass Production	QDR I - 2B
			K7Q161864B	165-FBGA	1.8v / 2.5v	2.5	167	1.5,1.8	Mass Production	QDR I - 4B
		512K x36	K7R163682B	165-FBGA	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	Mass Production	QDR II - 2B
			K7R163684B	165-FBGA	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	Mass Production	QDR II - 4B
			K7Q163662B	165-FBGA	1.8v / 2.5v	2.5	167	1.5,1.8	Mass Production	QDR I - 2B
			K7Q163664B	165-FBGA	1.8v / 2.5v	2.5	167	1.5,1.8	Mass Production	QDR I - 4B
QDR II+	36Mb	1M x36	K7S3218T4C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	QDR II + 4B
		2M x18	K7S3236T4C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	QDR II + 4B
	18Mb	1M x18	K7S1618T4C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	QDR II + 4B
		512K x36	K7S1636T4C	165-FBGA	1.8	0.45	450, 400, 333	1.5	Mass Production	QDR II + 4B

NOTES: For QDR I, QDR II: 2B = Burst of 2, 4B = Burst of 4
For QDR II (36Mb): C-die use 300, 250MHz or 200MHz instead of 167MHz using a stable DLL circuit
For QDR II (72Mb): 2B = Burst of 2 and 250MHz or 200MHz is recommended, 4B = Burst of 4 and 300MHz or 250MHz is recommended
For QDR II+: 2-clock latency supported. 2.5-clock latency can be supported with 450MHz speed

SYNCHRONOUS SRAM ORDERING INFORMATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
K	7	X	X	X	X	X	X	X	X	-	X	X	X	X	X

Digit	Field
1	SAMSUNG Memory
2	Sync SRAM
3	Small Classification
4	Density
5	Density
6	Organization
7	Organization
8	Vcc, Interface, Mode
9	Vcc, Interface, Mode
10	Generation
11	---
12	Package
13	Temp, Power
14	Speed
15	Speed
16	Packaging Type

1. Memory (K)

2. Sync SRAM: 7

3. Small Classification

A: Sync Pipelined Burst
B: Sync Burst
D: Double Data Rate
I: Double Data Rate II, Common I/O
J: Double Data Rate, Separate I/O
K: Double Data II+, Common I/O
M: Sync Burst + NtRAM
N: Sync Pipelined Burst + NtRAM
P: Sync Pipe
Q: Quad Data Rate I
R: Quad Data Rate II
S: Quad Data Rate II+

4~5. Density

80: 8M	16: 18M
40: 4M	32: 36M
64: 72M	

6~7. Organization

08: x8	09: x9
18: x18	32: x32
36: x36	

8~9. Vcc, Interface, Mode

00: 3.3V,LVTTL,2E1D WIDE
01: 3.3V,LVTTL,2E2D WIDE
08: 3.3V,LVTTL,2E2D Hi SPEED
09: 3.3V,LVTTL,Hi SPEED
11: 3.3V,HSTL,R-R
12: 3.3V,HSTL,R-L
14: 3.3V,HSTL,R-R Fixed ZQ
22: 3.3V,LVTTL,R-R
23: 3.3V,LVTTL,R-L
25: 3.3V,LVTTL,SB-FT WIDE
30: 1.8/2.5/3.3V,LVTTL,2E1D
31: 1.8/2.5/3.3V,LVTTL,2E2D
35: 1.8/2.5/3.3V,LVTTL,SB-FT
44: 2.5V,LVTTL,2E1D
45: 2.5V,LVTTL,2E2D
49: 2.5V,LVTTL,Hi SPEED
52: 2.5V,1.5/1.8V,HSTL,Burst2
54: 2.5V,1.5/1.8V,HSTL,Burst4
62: 2.5V/1.8V,HSTL,Burst2
64: 2.5V/1.8V,HSTL,Burst4
66: 2.5V,HSTL,R-R
74: 1.8V,2.5V,HSTL,All
82: 1.8V,HSTL,Burst2
84: 1.8V,HSTL,Burst4
88: 1.8V,HSTL,R-R
T2: 1.8V,2Clock Latency,Burst2
T4: 1.8V,2Clock Latency,Burst4
U2: 1.8V,2.5Clock Latency,Burst2
U4: 1.8V,2.5Clock Latency,Burst4

10. Generation

M: 1st Generation
A: 2nd Generation
B: 3rd Generation
C: 4th Generation
D: 5th Generation

11. "--"

12. Package

H: BGA,FCBGA,PBGA
G: BGA, FCBGA, FBGA (LF)
F: FBGA
E: FBGA (LF)
Q: (L)QPF
P: (L)QFP(LF)
C: CHIP BIZ
W: WAFER

13. Temp, Power

COMMON (Temp,Power)

0: NONE,NONE (Containing of error handling code)
C: Commercial,Normal
E: Extended,Normal
I: Industrial,Normal

WAFER, CHIP BIZ Level Division

0: NONE,NONE
1: Hot DC sort
2: Hot DC, selected AC sort

14~15. Speed

Sync Burst,Sync Burst + NtRAM

< Mode is R-L > (Clock Accesss Time)

65: 6.5ns	70: 7ns
75: 7.5ns	80: 8ns
85: 8.5ns	

Other Small Classification (Clock Cycle Time)

10: 100MHz	11: 117MHz
13: 133MHz	14: 138MHz
16: 166MHz	20: 200MHz
25: 250MHz	
26: 250MHz(1.75ns)	27: 275MHz
30: 300MHz	33: 333MHz
35: 350MHz	37: 375MHz
40: 400MHz(t-CYCLE)	42: 425MHz
45: 450MHz	
50: 500MHz (except Sync Pipe)	

16. Packing Type (16 digit)

- Common to all products, except of Mask ROM
- Divided into TAPE & REEL (In Mask ROM, divided into TRAY, AMMO packing separately)

Type	Packing Type	New Marking
Component	TAPE & REEL	T
	Other (Tray, Tube, Jar)	0 (Number)
	Stack	S
Component	TRAY	Y
(Mask ROM)	AMMO PACKING	A
Module	MODULE TAPE & REEL	P
	MODULE Other Packing	M

MCP: NAND/DRAM

NAND Density	DRAM Density/Organization	Voltage (NAND-DRAM)	MCP Package	PoP Package
512Mb	256Mb (x16,x32)	2.7V/1.8V - 1.8V	107/137FBGA	120FBGA
	512Mb (x16,x32)	2.7V/1.8V - 1.8V	107/137FBGA	120/136FBGA
1Gb	256Mb (x16,x32)	*3.0V/1.8V - 1.8V	107/137FBGA	152FBGA
	512Mb (x16,x32)	*2.7V/1.8V - 1.8V	107/137FBGA	119/152FBGA
	1Gb (x32)	1.8V - 1.8V	137FBGA	
2Gb	512Mb (x16,x32)	1.8V - 1.8V	107/137FBGA	119/152FBGA
	1Gb (x16,x32)	1.8V - 1.8V	107/137FBGA	152/160/168FBGA
4Gb	1Gb (x32)	2.7V - 1.8V	137FBGA	137FBGA

MCP: OneNAND/DRAM

OneNAND Density	DRAM Density/Organization	Voltage (NAND-DRAM)	MCP Package	PoP Package
512Mb	256Mb (x32)	3.3V/1.8V - 1.8V	188FBGA	152FBGA
	512Mb (x16,x32)	1.8V - 1.8V	167/202FBGA	152FBGA
	768Mb (x32)	1.8V - 1.8V	-	152FBGA
1Gb	512Mb (x16,x32)	1.8V - 1.8V	167/202FBGA	168FBGA
	1Gb (x32)	1.8V - 1.8V	-	168FBGA
2Gb	512Mb (x16,x32)	1.8V - 1.8V	-	152/160/168FBGA
	1Gb (x16,x32)	1.8V - 1.8V	167/202FBGA	152/160/168FBGA
	2Gb (x32)	1.8V - 1.8V		152/168FBGA
4Gb	1Gb (x16)	1.8V - 1.8V	202FBGA	-

MCP: FlexOneNAND/DRAM

(Flex)OneNAND Density	DRAM Density/Organization	Voltage (NAND-DRAM)	MCP Package	PoP Package
8Gb	2Gb (x32)	1.8V - 1.8V	202FBGA	

MCP: OneNAND/DRAM/OneDRAM

(Flex)OneNAND Density	DRAM Density/Organization	Voltage (NAND-DRAM)	MCP Package	PoP Package
2Gb	1Gb (x16)	1.8V - 1.8V		216FBGA

MCP: moviNAND/NAND/DRAM

OneNAND Density	DRAM Density/Organization	Voltage (MoviNAND/NAND-DRAM)	MCP Package
1GB & 1Gb	1Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
1GB & 2Gb	1Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
	2Gb (x32)	2.8V/1.8V - 1.8V	199FBGA
2GB & 2Gb	1Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
	2Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
4GB & 2Gb	1Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
	2Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
8GB & 2Gb	1Gb (x32)	3.3V/1.8V - 1.8V	199FBGA
	2Gb (x32)	3.3V/1.8V - 1.8V	199FBGA

MCP: NOR/UtRAM

NOR Density	UtRAM or DRAM Density/ Organization	Voltage (NOR-DRAM)	Package
512Mb	128Mb	1.8V - 1.8V	107FBGA
256Mb	128Mb	1.8V - 1.8V	107FBGA
		3.0V - 3.0V	84FBGA
	64Mb	3.0V - 3.0V	84FBGA
		1.8V - 1.8V	56FBGA
128Mb	64Mb	1.8V - 1.8V	84/88FBGA
	32Mb	1.8V - 1.8V	84/88FBGA
		3.0V - 3.0V	64FBGA
64Mb	32Mb	3.0V - 3.0V	56FBGA

MCP: NOR/DRAM

NOR Density	UtRAM or DRAM Density/ Organization	Voltage (NOR-DRAM)	Package
512Mb	128Mb (x16)	1.8V - 1.8V	103FBGA
	256Mb (x16)	1.8V - 1.8V	103FBGA

MCP: OneDRAM/OneNAND/NAND

OneDRAM				OneNAND/NAND				Version	Part No.	PKG Information	
Org	Vcc	Speed	Opr.	Org	Vcc	Speed	Type			Size	Type
A-port : x32 B-port : x32	1.8V	166MHz@CL=3	A-port : SDR B-port : DDR	x16	1.8V	83Mhz	Mux	AQD	KAC00F008M-AE77000	14*14*1.15	240FBGA
A-port : x16 B-port : x32	1.8V	166MHz@CL=3	A-port : DDR B-port : DDR	x16	1.8V	83Mhz	Mux	AQD	KAC00F00XM-AE77000	14*14*1.15	240FBGA
A-port : x16 B-port : x32	1.8V	166MHz@CL=3	A-port : SDR B-port : DDR	x16	1.8V	83Mhz	Mux	AQD	TBD	14*14*1.15	240FBGA
A-port : x32 B-port : x32	1.8V		A-port : SDR B-port : DDR	x16	1.8V	83Mhz	Mux	AAQD	KBZ00900PM-A439000	14*14*1.25	240FBGA

* OneDRAM 512Mb now EOL
* Based on demand, OneDRAM is in MCP only, not in discrete package

OneNAND

OneNAND is a monolothic IC that combines a NAND flash array with a NOR flash interface plus an SRAM buffer. It's ideal for high-performance, high-density applications.

Density	Part Number	Package	Org.	Voltage (V)	Temp.	Speed	MOQ (Tray)	Remarks
512Mb	KFG1216Q2B-DEB8000	63FBGA (9.5x12)	X16	1.8	extended	83Mhz	1,120	
	KFG1216U2B-DIB6000	63FBGA (9.5x12)	X16	3.3	industrial	66Mhz	1,120	
	KFG1216Q2B-SEB8000	67FBGA (7x9)	X16	1.8	extended	83Mhz	1,120	
	KFG1216U2B-SIB6000	67FBGA (7x9)	X16	3.3	industrial	66Mhz	1,120	
	KFM1216Q2B-DEB8000	63 FBGA (9.5x12)	X16	1.8v	extended	83Mhz	1,120	Muxed
1Gb	KFG1G16U2C-AIB6000	63 FBGA (10x13)	X16	3.3v	industrial	66Mhz	1,120	
	KFG1G16Q2C-AEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	
	KFM1G16Q2C-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	Muxed
2Gb	KFG2G16Q2A-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	
	KFM2G16Q2A-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	Muxed
4Gb DDP	KFH4G16Q2A-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	

*T&R MOQ 2Kpcs
****Please contact your local Samsung sales representative for latest product offerings & information on support & availability.**
NOTE: All parts are lead free

Flex-OneNAND

A monolithic IC with a NAND flash array using a NOR flash interface, Flex-OneNAND enables partitioning into SLC and MLC areas so the chip can be configured for storage or high-speed access.

Density	Part Number	Package	Org.	Voltage (V)	Temp.	Speed	MOQ (Tray)	Remarks
4Gb Flex-OneNAND	KFG4GH6Q4M-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	FSR software required
	KFG4GH6U4M-DIB6000	63 FBGA (10x13)	X16	3.3V	Industrial	66Mhz	1,120	FSR software required
	KFM4GH6Q4M-DEB8000	63 FBGA (10x13)	X16	1.8v	extended	83Mhz	1,120	Muxed. FSR SW req.
8Gb DDP Flex-OneNAND	KFH8GH6U4M-DIB6000	63 FBGA (10x13)	X16	3.3V	Industrial	66Mhz	1,120	FSR software required

*T&R MOQ 2Kpcs
****Please contact your local Samsung sales representative for latest product offerings & information on support & availability.**
NOTE: All parts are lead free

moviNAND

Combining high-density MLC NAND flash with an MMC controller in a single chip that has an MMC interface, moviNAND delivers dense, cost-effective storage for embedded applications.

moviNAND Densities	Vol(V)	Package	Package Size	Org.
1GB	1.8/3.3	FBGA	12.0x18x1.2t	x8
2GB	1.8/3.3	FBGA	12.0x18x1.2t	x8
4GB	1.8/3.3	FBGA	12.0x18x1.2t	x8
8GB	1.8/3.3	FBGA	12.0x18x1.3t	x8
16GB	1.8/3.3	FBGA	14.0x18.0	x8

Please contact your local Samsung sales representative for latest product offerings.
NOTE: All parts are lead free

OneDRAM

OneDRAM is a dual-port, low-power DRAM with an SRAM buffer interface and is optimal for high-performance, high-density mobile applications.

Density	Part Number	Package	Org.	Voltage (V)	Temp.	Speed	MOQ (Tray)	Remarks
512Mb	KJA51Z23PC-AAO	216FBGA (14x14)	A-port:x16(SDR/DDR) B-port:x16(SDR/DDR)	1.8V	extended	133MHz		PKG Combination: 2G OneNAND + 512Mb MDDR + 512MB OneDRAM MCP P/N: KAC00F00JM
	KJA51Y23PC-AAO	152FBGA (14x14)	A-port:x16(SDR/DDR) B-port:x16(SDR/DDR)	1.8V	extended	133MHz		PKG Combination: 2G NAND + 512Mb MDDR + 512Mb OneDRAM MCP P/N: KAR00900GM

3.5" Hard Disk Drives

Family	Capacity (GB)	RPM	Interface	Buffer	Model
F1	1TB	7200	SATA-2	32MB	HD103UJ
	750	7200	SATA-2	32MB	HD753LJ
	750	7200	SATA-2	16MB	HD752LJ
	640	7200	SATA-2	16MB	HD642JJ
	500	7200	SATA-2	16MB	HD502IJ
	500	7200	SATA-2	8MB	HD501IJ
	320	7200	SATA-2	16MB	HD322HJ
	250	7200	SATA-2	16MB	HD252HJ
	250	7200	SATA-2	8MB	HD251HJ
	160	7200	SATA-2	16MB	HD162GJ
	160	7200	SATA-2	8MB	HD161GJ
T166S	500	7200	SATA-2	8	HD500LJ
	500	7200	SATA-2	16	HD501LJ
	320	7200	SATA-2	8	HD320KJ
	320	7200	SATA-2	16	HD321KJ
T133S	400	7200	SATA-2	8	HD400LI
	400	7200	SATA-2	16	HD401LI
	300	7200	SATA-2	8	HD300LI
T133	400	7200	PATA	8	HD400LD
	300	7200	PATA	8	HD300LD
S250	250	7200	SATA-2	8	HD250HJ
S166S	160	7200	SATA-2	8	HD161HJ
	120	7200	SATA-2	8	HD120HJ
	80	7200	SATA-2	2	HD081GJ
	80	7200	SATA-2	8	HD082GJ
	40	7200	SATA-2	2	HD041GJ
	40	7200	SATA-2	8	HD042GJ
P120S	250	7200	SATA-2	8	SP2504C
	250	7200	SATA-2	8	SP2004C
P120	250	7200	PATA	8	SP2514N
	200	7200	PATA	8	SP2014N
P80SD	160	7200	SATA-2	8	HD160JJ
	120	7200	SATA-2	8	HD120IJ
	80	7200	SATA-2	8	HD080HJ
P80SD	160	7200	PATA	2	SP1644N
	160	7200	PATA	8	SP1654N
	120	7200	PATA	2	SP1243N
	120	7200	PATA	8	SP1253N
	80	7200	PATA	2	SP0842N

3.5" Enterprise RAID Drives

Family	Capacity (GB)	RPM	Interface	Buffer	Model
F1R	1TB	7200	SATA-2	32	HE103UJ
	750	7200	SATA-2	32	HE753LJ
	500	7200	SATA-2	16	HE502IJ
	320	7200	SATA-2	16	HE322HJ
	250	7200	SATA-2	16	HE252HJ

2.5" Hard Disk Drives

Family	Capacity (GB)	RPM	Interface	Buffer	Model
M6	320	5400	SATA	8	HM320JI
	250	5400	SATA	8	HM251JI
M5S	250	5400	SATA	8	HM250JI
	160	5400	SATA	8	HM160HI
	120	5400	SATA	8	HM121HI
	80	5400	SATA	8	HM080GI
	60	5400	SATA	8	HM061GI
M5P	160	5400	PATA	8	HM160HC
	120	5400	PATA	8	HM121HC
	80	5400	PATA	8	HM080GC
M80S	160	5400	SATA	8	HM160JI
	120	5400	SATA	8	HM120II
	80	5400	SATA	8	HM080HI
M80	160	5400	PATA	8	HM160JC
	120	5400	PATA	8	HM120IC
	80	5400	PATA	8	HM080HC
M60S	120	5400	SATA	8	HM120JI
	100	5400	SATA	8	HM100JI
	60	5400	SATA	8	HM060HI
M60	120	5400	PATA	8	HM120JC
	100	5400	PATA	8	HM100JC
	60	5400	PATA	8	HM060HC

1.8" Hard Disk Drives

Family	Capacity (GB)	RPM	Interface	Buffer	Model
N1 (3600rpm)	60	3600	PATA	2	HS061HA
			CEATA	2	HS061HP
	40		PATA	2	HS041HA
			CEATA	2	HS041HP
	30		PATA	2	HS031GA
			CEATA	2	HS031GP
	20		PATA	2	HS021GA
			CEATA	2	HS021GP
N1 (4200rpm)	60	4200	PATA	2	HS060HB
			CEATA	2	HS060HQ
	40		PATA	2	HS040HB
			CEATA	2	HS040HQ
	30		PATA	2	HS030GB
			CEATA	2	HS030GQ
	20		PATA	2	HS020GB
			CEATA	2	HS020GQ

External Hard Disk Drives

Family	Size	Capacity (GB)	Model #	Interface	Operating System	Dimensions
S1 Mini	1.8"	120	HXSU012BA	USB 2.0	Windows 2000 Pro/Vista/XP; Mac OS X 10.4.8 or later	15x87x62mm
S2 Portable	2.5"	160	HXSU016BA	USB 2.0	Windows 2000 Pro/Vista/XP; Mac OS X 10.4.8 or later	17x111x82mm
		160	HXMU016DA			
		250	HXMU025DA			
		320	HXMU032DA			
		400	HXMU040DA			
		500	HXMU050DA			

SH-S222L Optical Storage

DISK FORMAT

1. DISC TYPE
- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-RW 4.7GB, DVD+R 4.7GB, DVD+R 8.5GB(Double-layer), DVD+RW 4.7GB, DVD-RAM 4.7GB/2.6GB
- WRITE: DVD 4.7GB(DVD±R, DVD±RW, DVD-RAM), Double Layer±R, CD-R, CD-RW
- Print: CD-R, DVD+/-R LS Media

2. DATA FORMAT:
- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read)

3. Recording:
- CD-R/RW: DAO, TAO, SAO, Packet Write(RW)
- DVD+R/RW: Sequential, Random(RW)
- DVD-R/RW: Incremental, DAO, Restricted Overwrite(RW)
- DVD-RAM: Random

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	22X (29.7 MB/sec)	16X (21.6MB/sec)
DVD+RW	8X (10.8MB/sec)	12X (16.2MB/sec)
DVD+R DUAL	16X (21.6MB/sec)	12X (16.2MB/sec)
DVD-R DUAL	12X (16.2MB/sec)	12X (16.2MB/sec)
DVD-R	22X (29.7 MB/sec)	16X (21.6MB/sec)
DVD-RW	6X (8.1MB/sec)	12X (16.2MB/sec)
DVD-ROM (Single)	-	16X (21.6MB/sec)
DVD-ROM (Dual)	-	12X (16.2MB/sec)
CD-ROM	-	48X (7.2MB/sec)
CD-R	48X (7.2MB/sec)	40X (6.0MB/sec)
US-RW	32X (4.8MB/sec)	40X (6.0MB/sec)
HS-RW	10X (1.5MB/sec)	40X (6.0MB/sec)
CD-RW	4X (0.6MB/sec)	40X (6.0MB/sec)
DVD-RAM	12X (16.2MB/sec)	12X (16.2MB/sec)
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	ATA/ATAPI (E-IDE)	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	148.2mm (W) x 42mm (H) X 170mm (D) with Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	yes	

SH-S222A Optical Storage

DISK FORMAT

1. DISC TYPE
- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-RW 4.7GB, DVD+R 4.7GB, DVD+R 8.5GB(Double-layer), DVD+RW 4.7GB, DVD-RAM 4.7GB/2.6GB
- WRITE: DVD 4.7GB(DVD±R, DVD±RW, DVD-RAM), Double Layer±R, CD-R, CD-RW

2. DATA FORMAT:
- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session (Read/Write), Multi-Border(Read)

3. Recording:
- CD-R/RW: DAO, TAO, SAO, Packet Write(RW)
- DVD+R/RW: Sequential, Random(RW)
- DVD-R/RW: Incremental, DAO, Restricted Overwrite(RW)
- DVD-RAM: Random

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	22X (29.7 MB/sec)	16X (21.6MB/sec)
DVD+RW	8X (10.8MB/sec)	12X (16.2MB/sec)
DVD+R DUAL	16X (21.6MB/sec)	12X (16.2MB/sec)
DVD-R DUAL	12X (16.2MB/sec)	12X (16.2MB/sec)
DVD-R	22X (29.7 MB/sec)	16X (21.6MB/sec)
DVD-RW	6X (8.1MB/sec)	12X (16.2MB/sec)
DVD-ROM (Single)	-	16X (21.6MB/sec)
DVD-ROM (Dual)	-	12X (16.2MB/sec)
CD-ROM	-	48X (7.2MB/sec)
CD-R	48X (7.2MB/sec)	40X (6.0MB/sec)
US-RW	32X (4.8MB/sec)	40X (6.0MB/sec)
HS-RW	10X (1.5MB/sec)	40X (6.0MB/sec)
CD-RW	4X (5.4MB/sec)	40X (6.0MB/sec)
DVD-RAM	12X (16.2MB/sec)	12X (16.2MB/sec)
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	ATA/ATAPI (E-IDE)	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	148.2mm (W) x 42mm (H) X 170mm (D) with bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

SH-S223Q Optical Storage

DISK FORMAT

1. DISC SUPPORT

- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-RW 4.7GB, DVD-RW 8.5 GB(Double-layer), DVD+R 4.7GB, DVD+R 8.5GB(Double-layer), DVD+RW 4.7GB, DVD-RAM 4.7GB/2.6GB
- WRITE: DVD 4.7GB(DVD±R, DVD±RW, DVD-RAM), Double Layer±R, Double Layer-RW, CD-R, CD-RW
- Print: DVD+/-R (LF Media [Label/Data Side] / Non LF Media [Data Side]) - (Optional)

2. DATA FORMAT:

- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read)

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	22X(29.7 MB/sec)	16X (21.6MB/sec)
DVD+RW	8X (10.8MB/sec)	12X (16.2MB/sec)
DVD+R DUAL	16X (21.6MB/sec)	12X (16.2MB/sec)
DVD-R DUAL	12X (16.2MB/sec)	12X (16.2MB/sec)
DVD-R	22X(29.7 MB/sec)	16X (21.6MB/sec)
DVD-RW	6X (8.1MB/sec)	12X (16.2MB/sec)
DVD-ROM (Single)	-	16X (21.6MB/sec)
DVD-ROM (Dual)	-	12X (16.2MB/sec)
CD-ROM	-	48X (7.2MB/sec)
CD-R	48X (7.2MB/sec)	40X (6.0MB/sec)
US-RW	32X (4.8MB/sec)	40X (6.0MB/sec)
HS-RW	10X (1.5MB/sec)	40X (6.0MB/sec)
CD-RW	4X (0.6MB/sec)	40X (6.0MB/sec)
DVD-RAM	12X (16.2MB/sec)	12X (16.2MB/sec)
Access Time	CD 110ms (Random), DVD 130ms (Random)	
Data transfer mode	SATA 1.5Gbps	
Interface	Serial-ATA	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	148.2mm (W) X 170mm (D) X 42mm (H) with bezel	
Buffer Protection	Applied	
Lead Free	Applied	
Light Scribe	Applied	

SH-S223F Optical Storage

DISK FORMAT

1. DISC SUPPORT

- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-RW 4.7GB, DVD-RW 8.5 GB(Double-layer), DVD+R 4.7GB, DVD+R 8.5GB(Double-layer), DVD+RW 4.7GB, DVD-RAM 4.7GB/2.6GB
- WRITE: DVD 4.7GB(DVD±R, DVD±RW, DVD-RAM), Double Layer±R, Double Layer-RW, CD-R, CD-RW
- Print: DVD+/-R (LF Media [Label/Data Side] / Non LF Media [Data Side]) - (Optional)

2. DATA FORMAT:

- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read)

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	22X(29.7 MB/sec)	16X (21.6MB/sec)
DVD+RW	8X (10.8MB/sec)	12X (16.2MB/sec)
DVD+R DUAL	16X (21.6MB/sec)	12X (16.2MB/sec)
DVD-R DUAL	12X (16.2MB/sec)	12X (16.2MB/sec)
DVD-R	22X(29.7 MB/sec)	16X (21.6MB/sec)
DVD-RW	6X (8.1MB/sec)	12X (16.2MB/sec)
DVD-ROM (Single)	-	16X (21.6MB/sec)
DVD-ROM (Dual)	-	12X (16.2MB/sec)
CD-ROM	-	48X (7.2MB/sec)
CD-R	48X (7.2MB/sec)	40X (6.0MB/sec)
US-RW	32X (4.8MB/sec)	40X (6.0MB/sec)
HS-RW	10X (1.5MB/sec)	40X (6.0MB/sec)
CD-RW	4X (0.6MB/sec)	40X (6.0MB/sec)
DVD-RAM	12X (16.2MB/sec)	12X (16.2MB/sec)
Access Time	CD 110ms (Random), DVD 130ms (Random)	
Data transfer mode	SATA 1.5Gbps	
Interface	Serial-ATA	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	148.2mm (W) x 42mm (H) X 170mm (D) with Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

SN-T083A [Slot-in Type] Optical Storage

DISK FORMAT

- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-RW, DVD+R 4.7GB, DVD+R 8.5GB(Double-layer), DVD+RW 4.7GB, DVD-RAM 4.7GB
- WRITE: DVD 4.7GB(DVD±R, DVD±RW, DVD-RAM), Double Layer±R,CD-R, CD-RW

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+RW	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-RW	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	8X (10.8MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	5X (6.75MB/sec)	5X (6.75MB/sec)
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	Serial-ATA	
Buffer Memory	2M	
Drive Install Form	Horizontal	
Size (W * H * L)	128 (W) x 12.7 (H) x 127 (D) without Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

SN-S083B Optical Storage

DISK FORMAT

1. DISC TYPE

- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD+R 4.7GB, DVD+R DL 8.5GB, DVD+RW 4.7GB, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-R DL 8.5GB, DVD-RW, DVD-RAM 4.7GB
- WRITE: DVD4.7GB(DVD±R/RW, DVD-RAM), DVD±R DL(8.5GB), CD-R/RW

2. DATA FORMAT:

- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read/Write)

3. Recording mode

- CD-R/RW: DAO, TAO, SAO, Packet Write(RW)
- DVD+R/RW: Sequential, Random(RW)
- DVD-R/RW: Incremental, DAO, Restricted Overwrite(RW)
- DVD-RAM: Random

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+RW	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD-RW	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	8X (10.8MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	5X (6.75MB/sec)	5X (6.75MB/sec)
Access Time	CD 150ms (Random), DVD 160ms (Random)	
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	Serial-ATA	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	128 (W) x 12.7 (H) x 127 (D) without Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

SN-S083M Optical Storage

DISK FORMAT

1. DISC TYPE

- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD+R 4.7GB, DVD+R DL 8.5GB, DVD+RW 4.7GB, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-R DL 8.5GB, DVD-RW, DVD-RAM 4.7GB
- WRITE: DVD4.7GB(DVD±R/RW, DVD-RAM), DVD±R DL(8.5GB), CD-R/RW

2. DATA FORMAT:

- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read/Write)

3. Recording mode

- CD-R/RW: DAO, TAO, SAO, Packet Write(RW)
- DVD+R/RW: Sequential, Random(RW)
- DVD-R/RW: Incremental, DAO, Restricted Overwrite(RW)
- DVD-RAM: Random

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+RW	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R DUAL	6X (8.1MB/sec)	6X (8.1MB/sec)
DVD-R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD-RW	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	8X (10.8MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	5X (6.75MB/sec)	5X (6.75MB/sec)
Access Time	CD 150ms (Random), DVD 160ms (Random)	
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	Serial-ATA	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	128 (W) x 12.7 (H) x 127 (D) without Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	yes	

SN-S082H Optical Storage

DISK FORMAT

- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session(Read/Write), Multi-Border(Read/Write)

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+RW	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+R DUAL	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-R DUAL	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD-RW	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	8X (10.8MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	5X (6.75MB/sec)	5X (6.75MB/sec)
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	ATA/ATAPI(E-IDE)	
Buffer Memory	2M	
Drive Install Form	Horizontal	
Size (W * H * L)	128 (W) x 12.7 (H) x 127 (D) without Bezel	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

SN-M242D Optical Storage

DISK FORMAT

CD-DA, CD-ROM, Video CD, CD-I/FMV, CD-ROM XA, Multi-Session Disc, DVD-ROM, DVD-VIDEO, DVD±R,DVD±RW, CD-R,CD-RW, DVD-RAM

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	-	8X (10.8MB/sec)
DVD+RW	-	8X (10.8MB/sec)
DVD+R DUAL	-	6X (8.1MB/sec)
DVD-R DUAL	-	6X (8.1MB/sec)
DVD-R	-	8X (10.8MB/sec)
DVD-RW	-	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	6X (8.1MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	-	5X (6.75MB/sec)
Data transfer mode	Ultra DMA Mode 2: 33.3MB/sec, Multiword DMA mode2: 16.6MB/sec, PIO Mode 4: 16.7MB/sec	
Interface	ATA/ATAPI (E-IDE)	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	128 X 12.7 X 129.0	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	

[USB 2.0] SE-S084B Optical Storage

DISK FORMAT

1. DISC TYPE
- READ: MASTERED DISC, CD-R, CD-RW, DVD-ROM, DVD+R 4.7GB, DVD+R DL 8.5GB, DVD+RW 4.7GB, DVD-R 3.95GB, DVD-R 4.7GB Authoring, DVD-R 4.7GB General, DVD-R DL 8.5GB, DVD-RW, DVD-RAM 4.7GB
- WRITE: DVD4.7GB(DVD±R/RW, DVD-RAM), DVD±R DL(8.5GB), CD-R/RW
- Print: CD-R, DVD+/-R Light Scribe Media

2. DATA FORMAT:
- CD: CD-DA, CD-ROM, MIXED-CD, CD-ROM XA, ENHANCED-CD, CD-EXTRA/CD+, Photo-CD, VIDEO-CD, CD-TEXT, CD-G, Multi-Session
- DVD: DDVD-RAM, DVD-ROM, DVD-VIDEO, Multi-Session (Read/Write), Multi-Border(Read/Write)

3. Recording mode
- CD-R/RW: DAO, TAO, SAO, Packet Write(RW)
- DVD+R/RW: Sequential, Random(RW)
- DVD-R/RW: Incremental, DAO, Restricted Overwrite(RW)
- DVD-RAM: Random

GENERAL SPECIFICATIONS

Data Transfer Rate MAX		
Media Type	**Write**	**Read**
DVD+R	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+RW	8X (10.8MB/sec)	8X (10.8MB/sec)
DVD+R DUAL	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-R DUAL	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-R	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-RW	6X (8.1MB/sec)	8X (10.8MB/sec)
DVD-ROM (Single)	-	8X (10.8MB/sec)
DVD-ROM (Dual)	-	8X (10.8MB/sec)
CD-ROM	-	24X (3.6MB/sec)
CD-R	24X (3.6MB/sec)	24X (3.6MB/sec)
US-RW	24X (3.6MB/sec)	24X (3.6MB/sec)
HS-RW	10X (1.5MB/sec)	24X (3.6MB/sec)
CD-RW	4X (0.6MB/sec)	24X (3.6MB/sec)
DVD-RAM	5X (6.75MB/sec)	5X (6.75MB/sec)
Access Time	CD 130ms (Random), DVD 160ms (Random)	
Interface	USB 2.0	
Buffer Memory	2M	
Drive Install Form	Horizontal / Vertical	
Size (W * H * L)	141mm (W) x 19mm (H) X 157mm (D)	
Buffer Protection	yes	
Lead Free	yes	
Light Scribe	no	



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